B. J. UNWIN FORESTRY CONSULTANCY Ltd.

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MEMBER ISA

Ref: 27th June 2019 Rev 7th April 2020 & 13th March 2021 - BJU/mmi

To: ***Middle Aston Ltd.***
c/o: Charles Sandy Esq.,
email: csandy@charterland.com
phone: 07887555302
Long Meadow House,
Chapel Lane,
Croughton,
NN13 5LR.

Dear Charles,

Hatch End Industrial Estate, Middle Aston, OX25 5QL - BS5837 Tree Constraints, Tree Impacts and Tree Protection Method Statement for commercial re-development.

Contents:

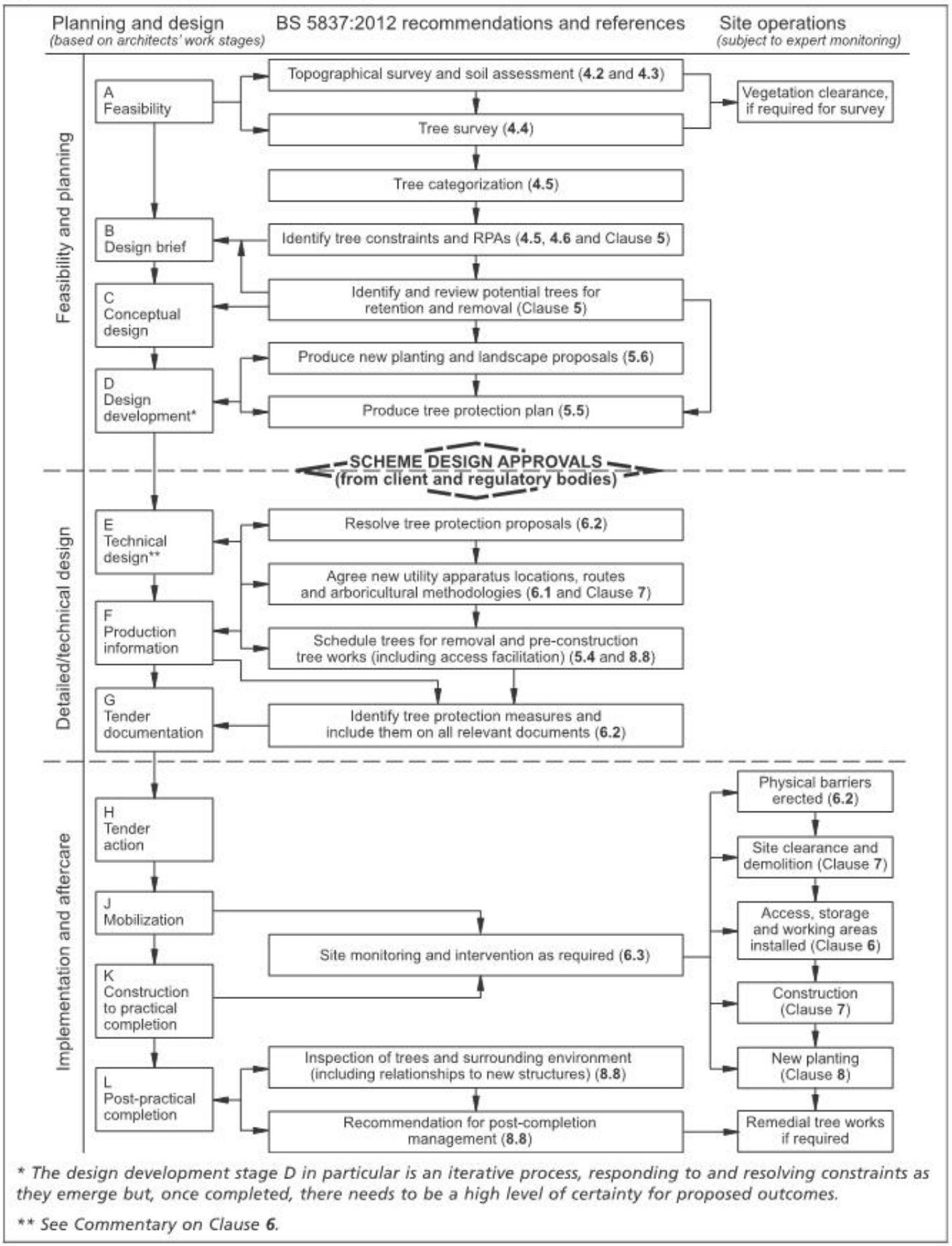
Tree and Woodland Consultancy
Woodland Valuation and Timber Sales
Landscape Management

Visit our website: www **bjunwin.co.uk** for more information

smas worksafe consultant as recognised by SSIP SAFETY SCHEMES IN PROCUREMENT

Visual Tree Assessment

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**.*

1. Instruction.

1.1 Middle Aston Ltd wish to re-develop Hatch End Industrial Estate, coverting existing buildings into a complex of offices. Therefore, Charles Sandy has asked B J Unwin Forestry Consultancy to advise on trees for planning application purposes, subject to quote.

1.2 The local authority (Cherwell District 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.

1.3 We have used a **topo survey by Astro Surveys Ltd A20/168/1A and 1B of July 2018** for constraints plans. **Proposed Site Plan 139990-P101 Rev A by Hawkins Projects**, 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*.

1.5 BS5837 flowchart previous page. Appendices follow signature page.

2. Inspection.

2.1 Owen Hutchison visited the property on 19th June 2019, and made an un-accompanied inspection. He returned November 2019 to detail the southern boundary trees. Jim Unwin returned 11th March 2021.

2.2 The survey was from ground level, involving visual observation (Visual Tree Assessment: Mattheck and Breloer, 1994 and Lonsdale, 1999). We measured dbh, (estimated for off-site and inaccessible trees) and measured or estimated crown spread and height.

2.3 The survey and report for this project are by Owen Hutchison, who has >10 years' experience working with trees and has been checked by Jim Unwin (professional-CV attached).

3. The Site.

3.1 The site inspected is an industrial estate, which occupies a former poultry farm. The industrial estate buildings and associated access roads and parking areas, are located in the eastern part of the site. The western part of the site is largely grassland. The site's eastern boundary meets Fir Lane, while the southern boundary meets Dr Radcliffe's C of E Primary School. Located to the west, there are further industrial units at Lakeside Farm, while to the north, there is a residential dwelling.

3.2 The site is slightly elevated with a very gentle fall east. It is not exposed to wind.

Superficial deposits: None recorded.

Bedrock geology: Northampton Sand Formation - Sandstone, Limestone And Ironstone. Sedimentary Bedrock formed approximately 170 to 174 million years ago in the Jurassic Period. Local environment previously dominated by shallow seas.

Therefore, natural subsoils and geology are likely to be coarse-textured, with low volume-change potential.

3.2 A public footpath runs adjacent to the site's southern boundary.

4. The Trees.

4.1 Trees on site:-

- Woodland group WG4 straddles the public footpath, on the site's southern boundary. This is a crowded group, containing many broken stems, and supressed and dead trees. Most notably, there is a large, dead, horse chestnut near the group's western end. We recommend that the woodland is thinned, by removing poor-quality, dead and supressed trees.
- Trees T6 to T10 are located on the site's western boundary, with Lakeside Farm. These comprise five mature horse chestnuts and one over-mature beech (T11).
- Trees T14 to T25 form a very attractive, old avenue. Trees T14 to T18 are horse chestnuts and form the eastern side of the avenue. Trees T19 to T25 are beech trees and form the western side of the avenue. The trees form part of a far larger avenue, which continues off-site, to the north.
- Overgrown hedge H31 surrounds the south-easterly, off-site building. It comprises predominantly field maple and hawthorn.
- Group G33 comprises three small hawthorns. These probably formed part of a larger hedge.

4.2 Off-site trees:-

- Laurel hedge H5 is located within the grounds of Lakeside Farm, on the sites south-western boundary.
- Tree T12 is a beech, located just beyond the site's northern boundary. Tree T13 is a supressed plum located beneath the crown of T12.
- Beech T26 is a continuation of the avenue, beyond the site's northern boundary.
- Groups G27, G28 and hedge H29 are located within the garden of a new residential property, north of the site.
- Group G30 A-K is a prominent row of road-side lime trees. The trees are located adjacent to the site's eastern boundary and Fir Lane.
- **T30E has basal weakening by *Kretzchmaria* fungal decay.**
- Lime T32 is a continuation of group G30, located at the southern end of the site's eastern boundary.

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

- Off-site group G30 is located along the western edge of Fir Lane. The group is a prominent landscape feature and offers visual amenity to users of Fir Lane.
- Woodland group WG4 is a prominent landscape feature and provides excellent wildlife habitat. It also provides screening between the primary school and industrial estate.
- Tree T14 to T25 form an impressive avenue. This represents an important landscape feature of high arboricultural value.
- We have not checked for presence of TPOs.

4.4 Photos below:

4.4.1 View south from entrance along lime group G30.

4.4.2 View north along Fir Lane. Off-site lime Group G30 to the left.

4.4.3 View north past hawthorns G33 on right to horse chestnuts and beech avenue trees beyond.

4.4.4 View east along northern boundary. Beech T25 foreground, then horse chestnut T18. Poplars G27 and mixed trees G28 beyond are off-site.

4.5 Detailed Tree Descriptions

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

Age class is described as:-

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

Health & Structural condition:- Self-explanatory:- **Good, Fair, Poor or Dead.**

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

Retention *categories*, based on BS 5837 Section 4.5, are:-
Retain:

A =	*High quality or value >40yrs safe life*:	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*

Remove:

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

(*Colour marking on relevant Tree plan)

Sub-category for retention:-
1 = Arboricultural Value
2 = Landscape Value
3 = Cultural and/or Habitat Conservation Value

***BS 5837:2012 Root Protection Area*:**
The estimated volume of soil 1m deep required to sustain the tree, usually expressed as a disc 1m deep, centred on the tree's trunk.
THE RPA CAN BE A VARIED SHAPE ENCLOSING THE CORRECT ROOTABLE AREA: but SHOWN AS A CIRCLE FOR CONVENIENCE.
Calculated as:-
Single-stem tree, radial distance **=** 12 x stem diameter at 1.5m ht.
Multi-stem trees 1-5 stems = *Square root of (sum of individual stem diameters squared).*
> 5 stems = *Square root of (average dbh squared x number of stems).*

4.5.2 **Hatch End Industrial Estate – BJUFC BS5837 inspection – updated 11th March 2021**

No. T=tree S= shrub H= hedge G= group	Species	Dbh (stem diam @ 1.5m ht) mm.	Total height. Ht to base of crown. Est Ht in 10 yrs. m.			Crown radii m.				Age class	Health	Structural Condition	SULE	Comment (All are in average to good health and condition, unless stated otherwise.)	Retention category A (best) to C. U = (remove) Sub-category 1, 2 or 3	BS 5837 Root Protection Area radius. m.	Recommended WORK excluding development.
						N	E	S	W								
T1	Common lime	300, 750 #	24	0	25	6	6	6	6	Lm	F	F	>40	Impressive off-site, road-side tree. Minor tip dieback. Extensive basal growth.	A2	7.7	Remove basal growth and inspect base.
T2	Common lime	150	8	0	10	0	3	3	3	Y	F	F/ P	10-20	Self-seeded, off-site tree. Supressed by neighbouring T1.	C2	1.8	
T3	Oak	100	5	2	7	0	3	3	2	Y	F/ P	F/ P	>40	Off-site, road-side tree. Supressed by neighbouring T2, but has potential.	C2	1.2	Consider removing T2, to improve growing conditions.

WG4	**Mixed species See also T34 to T227 for details.**	**350 Ave. #**	**10 to 18**	**0**	**Up to 20**	**Up to 7 ext .**	**7**	**7**	**7**	**Y - M**	**F/ P**	**F/ P**	**>40**	**Large group straddling the footpath along the site's southern boundary. Comprising alder, ash, horse chestnut, oak, rowan, cherry, hawthorn and beech. Very crowded group, with many supressed and dead trees. Many broken stems. The group is a prominent landscape feature.**	**A2**	**4.2**	**Thin by removing dead and supressed tree. Remove all broken and stems and branches.**
H5	**Laurel**	**100**	**3 to 6**	**0**	**3-6**	**0.5**	**0.5**	**0.5**	**0.5**	**Sm**	**F**	**F**	**20-40**	**Off-site boundary hedge. Well-pruned and maintained, but differs between 2m and 4m in height.**	**C2**	**1.2**	**Reduce all to 2m in height.**
T6	**Horse chestnut**	**960**	**15**	**1**	**17**	**8**	**7**	**7**	**7**	**M**	**F**	**F**	**>40**	**Ivy covered main stem. Animal burrow at base to the east.**	**A2**	**11.5**	
T7	**Horse chestnut**	**1010**	**14**	**1**	**16**	**6**	**7**	**9**	**8**	**M**	**F**	**P**	**10-20**	**Large historic tear-out wound on the north side and south west side of the main stem. Extensive decay ingress resulting from wound.**	**C2**	**12.1**	**Pollard at 10m. Remove five bottom limbs.**

T8	**Horse chestnut**	**1140**	**16**	**2**	**18**	**8**	**9**	**8**	**7**	**M**	**F**	**F**	**20-40**	**Historic basal wound to the north, with minor decay ingress. Comprising three stems from 3m.**	**B1, B2**	**13.7**	
T9	**Horse chestnut**	**1020**	**18**	**1**	**18**	**8**	**6**	**8**	**7**	**M**	**F**	**F/P**	**20-40**	**Two stems originating from a bark-included union at 2m. Exhibiting significant reaction wood, but likely to fail in the future.**	**B2**	**12.2**	**Install two crossing 9mm wire braces attached to four through eye-bolts at 2/3 tree height. This is 'fit & forget'.**
T10	**Horse chestnut**	**840**	**16**	**1**	**18**	**9**	**9**	**10**	**9**	**M**	**F**	**F**	**20-40**	**Attractive tree on the site's northern boundary. Heavy limbs over boundary carpark.**	**B2**	**10.1**	**Reduce W side by 2m, reduce SW side by 4m.**
T11	**Beech**	**1100**	**20**	**1**	**20**	**10**	**8**	**7**	**8**	**Om**	**F/P**	**P**	**10-20**	**Cavity in the main stem to the north-west, from 1.5m to 4m above ground level. Extensive decay within. Previously crown reduced to mitigate stem decay.**	**B2**	**13.2**	**Leave alone unless use around tree intensifies.**
T12	**Beech**	**800#**	**26**	**1**	**26**	**4**	**10**	**10**	**8**	**M**	**F**	**F**	**>40**	**Impressive off-site beech. Multiple stems at 5m.**	**A1, A2**	**9.6**	
T13	**Plum**	**200, 100, 100, 90 #**	**9**	**1.5**	**10**	**1**	**3**	**3**	**3**	**Em**	**F**	**F/P**	**10-20**	**Off-site plum. Supressed by neighbouring beech trees.**	**C2**	**2.6**	

T14	**Horse chestnut**	**930**	**16**	**1**	**18**	**6**	**9**	**8**	**9**	**M**	**F**	**F/P**	**>40**	**Avenue tree. Ribbed main stem, with a lean to the south east.**	**A2**	**11.2**	
T15	**Horse chestnut**	**860**	**20**	**2**	**20**	**5**	**9**	**10**	**4**	**M**	**F**	**F**	**>40**	**Avenue tree. Three stems at 2,5m.**	**A2**	**10.3**	
T16	**Horse chestnut**	**800**	**18**	**2**	**20**	**8**	**11**	**7**	**3**	**Om**	**F**	**F/P**	**>40**	**Avenue tree. Supressed western canopy. Historic tear-out wound on lowest limb, extending South east. Stress cracks in limbs above.**	**B2**	**9.6**	**Reduce whole of NE, E & SE sides by one-third off radii to full tree height.**
T17	**Horse chestnut**	**720**	**20**	**1.5**	**20**	**6**	**7**	**7**	**4**	**Em**	**F**	**F**	**>40**	**Avenue tree. Slight lean south-east.**	**A2**	**8.6**	
T18	**Horse chestnut**	**1230**	**22**	**0-2**	**22**	**7**	**11**	**11**	**4**	**M**	**F**	**F**	**>40**	**Avenue tree. Multi-stemmed at 2m.**	**A1, A2**	**14.8**	
T19	**Beech**	**1150**	**30**	**0-2**	**30**	**5**	**8**	**9**	**11**	**M**	**F**	**F**	**>40**	**Impressive end of avenue tree.**	**A2**	**13.8**	
T20	**Beech**	**1090**	**30**	**0-2**	**30**	**5**	**10**	**4**	**11**	**M**	**F**	**F/P**	**20-40**	**Avenue tree. Interesting ribbed stem formation. Orange-peel bark. Codominant stems, originating from bark included union at 5m.**	**B2**	**13.1**	

T21	Beech	820	30	1-3	30	4	9	5	8	Em / M	F	F	>40	Avenue tree. Codominant stems, originating from wide union at 5m. Basal cavity with minor decay to the west.	A2	9.8	
T22	Beech	940	30	0-3	30	6	9	6	11	M	F/ P	F	20-40	Avenue tree. Evidence of beech bark bleed on main stem.	B2	11.3	
T23	Beech	810	30	0-3	30	3	11	4	12	Em / M	F	P	10-20	Avenue tree. Huge wound on south side, from base to 1.2m. Codominant stems, originating from bark included union at 5m. But sheltered by adjacent trees.	B2	9.7	
T24	Beech	910	30	0-3	30	8	9	3	13	M	F	F	>40	Avenue tree. Codominant stems, originating from a wide union, with good ear formation at 4m.	A1, A2	10.9	
T25	Beech	1070	30	0-3	30	7	11	10	7	M	F	F	>40	Avenue tree, with impressive buttressing.	A1, A2	12.8	
T26	Beech	1100	30	0-3	30	4	9	5	12	M	F	F/ P	20-40	Off-site tree, with estimated position and dimensions. Decayed basal wound to the south.	B2	13.2	
G27	Balsam poplars x3	500 Ave. #	32	3	32	4	5	5	3	M	F	F	20-40	Three off-site poplars, with estimated position and dimensions.	B2	6.0	

G28	**Mixed species**	**500 Ave. #**	**6-12**	**2**	**6-14**	**5**	**5**	**5**	**5**	**Em**	**F**	**F**	**>40**	**Group of off-site, garden ornamental trees, with estimated position and dimensions. Comprising silver birch, hazel, weeping willow, cherries and hornbeam.**	**B2**	**6.0**	
H29	**Laurel**	**50**	**1**	**0**	**1.2**	**0.25**	**0.25**	**0.25**	**0.25**	**Y**	**F**	**F**	**>40**	**Off-site, newly-planted hedge, with estimated position and location.**	**C2**	**1.2**	**Trim annually to maintain desired size and shape.**
G30 A-K	**Common limes**	**1000 Ave. #**	**18-26**	**0**	**20-30**	**6-8 ext.**	**6-8 ext.**	**6-8 ext.**	**6-8 ext.**	**Em - M**	**F**	**P-F**	**>40**	**Dense basal growth. Deadwood over the road, in many crowns. Prominent landscape feature.**	**A2**	**12.0**	**Remove basal growth and inspect bases. Remove deadwood over the road.**
G30E	**Common lime.**													***Kretzchmaria deusta* basal decay, over road and site entrance.**			**Pollard at forks at 13m. Reduce western limb to first upright.**
H31	**Mixed species**	**200 Ave. #**	**8**	**1**	**9**	**4 ext.**	**4**	**4 ext.**	**4 ext.**	**Sm**	**F**	**P-F**	**20->40**	**Comprising predominantly field maple and hawthorn. Planted as a hedge, but not maintained as one.**	**C2**	**2.4**	**Reduce height to 3m and cut back sides hard. Allow to regenerate and trim annually to maintain size and shape.**
G31 A	**Field maple x 4, rowan x 2**	**200**	**5-8**	**1**	**6-10**	**2.5 ext**	**2.5 ext**	**2.5 ext**	**2.5 ext.**	**Sm**	**F**	**F**	**>40**	**Really part of hedge G31.**	**C2**	**2.4**	
T32	**Common lime**	**1100 #**	**24**	**4**	**26**	**7**	**8**	**6**	**8**	**M**	**F**	**F**	**>40**	**Twin stems at 5m. Dead ivy on main stems.**	**A2**	**13.2**	

G33	**Hawthorns x 3**	**150**	**3**	**0**	**5**	**3**	**3**	**3**	**3**	**Em**	**F**	**F**	**>40**	**Three hawthorns, once part of a larger hedge. Now trees.**	**C2**	**1.8**	

WG4, Hatch End Industrial Estate, OX25 5QL – BJUFC BS5837 inspection – update 22nd November 2019
See also WG4 above.

No. T=tree S= shrub H= hedge G= group	Species	Dbh (stem diam @ 1.5m ht) mm.	Total height. Ht to base of crown. Est Ht in 10 yrs. m.			Crown radii m.				Age class	Health	Structural Condition	SULE	Comment (All are in average to good health and condition, unless stated otherwise.)	Retention category A (best) to C. U = (remove) Sub-category 1, 2 or 3	BS 5837 Root Protection Area radius. m.	Recommended WORK excluding development.
						N	E	S	W								
T34	**Blackthorn**	**100, 100, 200, 220**								**M**	**F**	**F/ P**			**C2**	**3.3**	
T35	**Blackthorn**	**120, 200**								**M**	**F**	**F/ P**			**C2**	**2.3**	
T36	**Sycamore**	**300**								**Sm**	**F**	**F**			**C2**	**3.6**	
T37	**Hawthorn**	**150**								**Em**	**F**	**F/ P**			**C2**	**1.8**	
T38	**Cherry**	**320**								**Em**	**F**	**F/ P**			**C2**	**3.8**	
T39	**Ash**	**140**								**Y**	**F/ P**	**F/ P**			**C2**	**1.7**	
T40	**Ash**	**300**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.6**	
T41	**Lime**	**250 Ave. 6 stems**								**Em**	**F**	**F/ P**			**C2**	**6.1**	

T42	**Ash**	**120, 140**								**Sm**	**F/P**	**F/P**			**C2**	**1.8**	
T43	**Horse chestnut**	**300**								**Sm**	**P**	**P**			**U**	**3.6**	
T44	**Beech**	**420**								**Sm**	**F**	**F**			**B2**	**5.0**	
T45	**Cherry**	**300**								**M**	**F/P**	**P**			**U**	**3.6**	
T46	**Cherry**	**300**								**M**	**F/P**	**F/P**			**C2**	**3.6**	
T47	**Ash**	**200, 310**								**Em**	**F**	**F/P**			**C2**	**3.7**	
T48	**Ash**	**150, 280**								**Em**	**F**	**F/P**			**C2**	**3.2**	
T49	**Goat willow**	**180, 180, 300**								**M**	**F**	**F/P**			**C2**	**3.9**	
T50	**Goat willow**	**400**								**M**	**F**	**F/P**			**C2**	**4.8**	
T51	**Goat willow**	**400, 400**								**M**	**F/P**	**F/P**			**C2**	**5.7**	
T52	**Goat willow**	**250, 250**								**M**	**F**	**F/P**			**C2**	**3.5**	
T53	**Horse chestnut**	**450**								**M**	**F**	**F**			**B2**	**5.4**	
T54	**Goat willow**	**450**								**M**	**F/P**	**F/P**			**C2**	**5.4**	
T55	**Lime**	**320**								**Sm**	**F**	**F/P**			**C2**	**3.8**	
T56	**Lime**	**180**								**Sm**	**F**	**F/P**			**C2**	**2.2**	
T57	**Ash**	**250**								**Sm**	**F**	**F/P**			**C2**	**3.0**	
T58	**Beech**	**240**								**Sm**	**F**	**F/P**			**C2**	**2.9**	
T59	**Horse chestnut**	**300**								**Sm**	**P**	**P**			**U**	**3.6**	
T60	**Goat willow**	**300**								**M**	**F/P**	**F/P**			**C2**	**3.6**	

T61	**English oak**	**200**								**Y**	**F**	**F/P**			**C2**	**2.4**	
T62	**Beech**	**410**								**Sm**	**F**	**F/P**			**B2**	**4.9**	
T63	**Goat willow**	**380**								**M**	**F/P**	**F/P**			**C2**	**4.6**	
T64	**Horse chestnut**	**180**								**Y**	**F/P**	**F/P**			**C2**	**2.2**	
T65	**Goat willow**	**250, 260, 280**								**M**	**F/P**	**F/P**			**C2**	**4.6**	
T66	**Beech**	**250**								**Y / Sm**	**F/P**	**F/P**			**C2**	**3.0**	
T67	**Lime**	**350**								**Sm**	**F**	**F/P**			**B2**	**4.2**	
T68	**cherry**	**400**								**M**	**F**	**F/P**			**C2**	**4.8**	
T69	**Goat willow**	**100, 150**								**Sm**	**F/P**	**F/P**			**C2**	**1.8**	
T70	**Goat willow**	**700**								**M**	**F**	**F/P**			**B2**	**8.4**	
T71	**Ash**	**380**								**Sm**	**F/P**	**F/P**			**C2**	**4.6**	
T72	**Beech**	**450**								**Sm**	**F**	**F**			**B2**	**5.4**	
T73	**Goat willow**	**280 Ave. 6 stems**								**M**	**F/P**	**F/P**			**C2**	**6.9**	
T74	**Horse chestnut**	**100, 150, 150, 200**								**Sm**	**F/P**	**F/P**			**C2**	**3.0**	
T75	**Horse chestnut**	**300**								**Sm**	**F/P**	**F/P**			**C2**	**3.6**	
T76	**Horse chestnut**	**450**								**Sm**	**F/P**	**F/P**			**C2**	**5.4**	
T77	**Goat willow**	**300**								**M**	**F**	**F/P**			**C2**	**3.6**	

T78	**Cherry**	**400**								**M**	**F**	**F/P**			**B2**	**4.8**	
T79	**Goat willow**	**450**								**M**	**F/P**	**F/P**			**C2**	**5.4**	
T80	**Cherry**	**420**								**M**	**F**	**F**			**B2**	**5.0**	
T81	**Goat willow**	**400**								**M**	**F/P**	**F/P**			**C2**	**4.8**	
T82	**Cherry**	**100, 150**								**Sm**	**F/P**	**F/P**			**C2**	**1.8**	
T83	**Silver birch**	**200, 200**								**Em**	**F**	**F/P**			**C2**	**2.8**	
T84	**Goat willow**	**600**								**M**	**F**	**F/P**			**B2**	**7.2**	
T85	**Beech**	**700**								**Em**	**F**	**F/P**			**B2**	**8.4**	
T86	**Ash**	**250**								**Sm**	**F**	**F/P**			**C2**	**3.0**	
T87	**Sycamore**	**200**								**Y/Sm**	**F/P**	**F/P**			**C2**	**2.4**	
T88	**Ash**	**180**								**Y**	**F/P**	**F/P**			**C2**	**2.2**	
T89	**Goat willow**	**180**								**Y**	**P**	**P**			**U**	**2.2**	
T90	**Goat willow**	**180, 200, 300, 300**								**M**	**F/P**	**F/P**			**C2**	**5.0**	
T91	**Beech**	**250**								**Y/Sm**	**F/P**	**F/P**			**C2**	**3.0**	
T92	**Cherry**	**300**								**Em**	**F/P**	**F/P**			**C2**	**3.6**	
T93	**Ash**	**400**								**Sm**	**F**	**F**			**B2**	**4.8**	
T94	**Sycamore**	**100, 150**								**Y**	**P**	**P**			**U**	**1.8**	

T95	**Ash**	**250**								**Y / Sm**	**P**	**P**			**U**	**3.0**	
T96	**Ash**	**250**								**Y / Sm**	**F/ P**	**F/ P**			**C2**	**3.0**	
T97	**Ash**	**200**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.4**	
T98	**Horse chestnut**	**180**								**Y**	**P**	**P**			**U**	**2.2**	
T99	**Beech**	**420**								**Sm / Em**	**F**	**F/ P**			**B2**	**5.0**	
T100	**Ash**	**200**								**Sm**	**P**	**P**			**U**	**2.4**	
T101	**Ash**	**300**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.6**	
T102	**Ash**	**200**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.4**	
T103	**Ash**	**280**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.4**	
T104	**Horse chestnut**	**180**								**Y / Sm**	**P**	**P**			**U**	**2.2**	
T105	**Hawthorn**	**80 Ave. 7 stems**								**Em**	**F**	**F/ P**			**C2**	**2.1**	
T106	**Hawthorn**	**100, 100, 150, 150**								**M**	**F**	**F/ P**			**C2**	**2.5**	
T107	**Sycamore**	**180, 200**								**Sm**	**P**	**P**			**U**	**2.7**	
T108	**Ash**	**250**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.0**	
T109	**Hawthorn**	**80**								**Sm**	**F/ P**	**F/ P**			**C2**	**1.0**	
T110	**Ash**	**200**								**Sm**	**P**	**P**			**U**	**2.4**	

T111	Ash	80, 120								Sm	P	P			U	1.4	
T112	Hawthorn	150, 150								Em	F	F/P			C2	2.1	
T113	Cherry	120								Y/Sm	F/P	F/P			C2	1.4	
T114	Cherry	210								Em	F/P	F/P			C2	2.5	
T115	Cherry	350								M	F/P	F/P			C2	4.2	
T116	Hawthorn	100, 120								Em	F/P	F/P			C2	1.6	
T117	Ash	100, 200, 250								Sm	F/P	F/P			C2	3.4	
T118	Ash	250								Sm	F	F/P			C2	3.0	
T119	Ash	250								Sm	F	F/P			C2	3.0	
T120	Ash	100								Y	P	P			U	1.2	
T121	Sycamore	50, 80, 200								Y/Sm	P	P			U	2.2	
T122	Sycamore	100, 100, 200								Sm	F/P	P			C2	2.5	
T123	Ash	200								Sm	F	F/P			C2	2.4	
T124	Ash	50, 80, 100								Y/Sm	P	P			U	1.4	
T125	Ash	150								Y	F/P	P			C2	1.8	
T126	Ash	230								Sm	F	F/P			C2	2.8	
T127	Ash	160								Y	F	F/P			C2	1.9	

T128	**Sycamore**	**260**								**Sm**	**F**	**F/P**			**C2**	**3.1**	
T129	**Ash**	**190, 240**								**Sm**	**F**	**F/P**			**C2**	**3.1**	
T130	**Ash**	**100, 100, 300, 320**								**Em**	**F**	**F/P**			**C2**	**4.6**	
T131	**Sycamore**	**280**								**Sm**	**F**	**F/P**			**C2**	**3.4**	
T132	**Ash**	**170**								**Sm**	**P**	**P**			**U**	**2.0**	
T133	**Sycamore**	**120, 160**								**Sm**	**P**	**P**			**U**	**2.0**	
T134	**Ash**	**220**								**Sm**	**F/P**	**F/P**			**C2**	**2.6**	
T135	**Sycamore**	**300**								**Sm**	**F**	**F/P**			**C2**	**3.6**	
T136	**Sycamore**	**50, 150, 280**								**Sm**	**F**	**F/P**			**C2**	**3.2**	
T137	**Sycamore**	**50, 50, 80, 300, 300**								**Sm / Em**	**F**	**F/P**			**C2**	**4.4**	
T138	**Lime**	**200, 200, 300**								**Sm / Em**	**F**	**F/P**			**C2**	**4.1**	
T139	**Rowan**	**50, 50, 50**								**Sm**	**F**	**F/P**			**C2**	**0.9**	
T140	**Ash**	**220, 200**								**Sm**	**F**	**F/P**			**C2**	**3.0**	
T141	**Sycamore**	**300**								**Sm**	**F**	**F**			**B2**	**3.6**	
T142	**Ash**	**200**								**Sm**	**F**	**F/P**			**C2**	**2.4**	
T143	**Ash**	**200, 200**								**Sm**	**F**	**F/P**			**C2**	**2.8**	

T144	**Ash**	**150, 150**								**Sm**	**F/P**	**F/P**			**C2**	**2.1**	
T145	**Ash**	**200**								**Sm**	**F/P**	**F/P**			**C2**	**2.4**	
T146	**Ash**	**150**								**Y/Sm**	**P**	**P**			**U**	**1.8**	
T147	**Ash**	**140, 200**								**Sm**	**F**	**F/P**			**C2**	**2.4**	
T148	**Ash**	**170**								**Sm**	**P**	**P**			**U**	**2.0**	
T149	**Ash**	**200 Ave. 7 stems**								**Sm**	**F**	**F/P**			**C2**	**5.3**	
T150	**Ash**	**170, 190**								**Sm**	**F**	**F/P**			**C2**	**2.6**	
T151	**Ash**	**50, 150, 150, 200**								**Sm**	**F**	**F/P**			**C2**	**3.0**	
T152	**Sycamore**	**160, 160, 170, 200**								**Em**	**F**	**F/P**			**C2**	**3.5**	
T153	**Sycamore**	**170**								**Sm**	**F/P**	**P**			**U**	**2.0**	
T154	**Ash**	**200**								**Sm**	**F/P**	**F/P**			**C2**	**2.4**	
T155	**Ash**	**200**								**Sm**	**F/P**	**F/P**			**C2**	**2.4**	
T156	**Ash**	**200**								**Sm**	**F/P**	**F/P**			**C2**	**2.4**	
T157	**Ash**	**230**								**Sm**	**F/P**	**F/P**			**C2**	**2.8**	
T158	**Ash**	**200**								**Sm**	**F/P**	**F/P**			**C2**	**2.4**	
T159	**Beech**	**310**								**Sm/Em**	**F**	**F/P**			**B2**	**3.7**	

T160	**Ash**	**100**								**Y**	**P**	**P**			**U**	**1.2**	
T161	**Ash**	**180**								**Y / Sm**	**F/ P**	**F/ P**			**C2**	**2.2**	
T162	**Horse chestnut**	**380**								**Sm / Em**	**F/ P**	**F/ P**			**C2**	**4.6**	
T163	**Sycamore**	**100**								**Y**	**P**	**P**			**U**	**1.2**	
T164	**Ash**	**350, 400' 450**								**M**	**F**	**F/ P**			**B2**	**6.0**	
T165	**Sycamore**	**100**								**Y**	**P**	**P**			**U**	**1.2**	
T166	**Ash**	**250, 350, 350**								**M**	**F**	**F/ P**			**B2**	**5.6**	
T167	**Ash**	**280**								**Sm**	**F**	**F/ P**			**C2**	**3.4**	
T168	**Ash**	**250**								**Sm**	**F**	**F/ P**			**C2**	**3.0**	
T169	**Ash**	**50, 100, 300**								**Em**	**F/ P**	**F/ P**			**C2**	**3.2**	
T170	**Ash**	**400**								**Em**	**F/ P**	**F/ P**			**C2**	**4.8**	
T171	**Ash**	**180**								**Sm**	**P**	**P**			**U**	**2.2**	
T172	**Ash**	**420**								**Em**	**F**	**F/ P**			**B2**	**5.0**	
T173	**Ash**	**120**								**Y**	**P**	**P**			**U**	**1.4**	
T174	**Ash**	**200, 420**								**Em**	**F/ P**	**F/ P**			**C2**	**4.7**	
T175	**Ash**	**300**								**Sm / Em**	**F**	**F/ P**			**C2**	**3.6**	

T176	**Sycamore**	**300**								**Sm / Em**	**F**	**F/ P**			**C2**	**3.6**	
T177	**Ash**	**200, 250, 350**								**Em**	**P**	**P**			**U**	**4.4**	
T178	**Ash**	**280**								**Sm**	**F/ P**	**P**			**U**	**3.4**	
T179	**Ash**	**350**								**Em**	**F**	**F/ P**			**C2**	**4.2**	
T180	**Ash**	**180, 430**								**Em**	**F**	**F/ P**			**B2**	**4.7**	
T181	**Ash**	**180**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.2**	
T182	**Horse chestnut**	**200, 200**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.8**	
T183	**Ash**	**400**								**Em**	**F**	**F/ P**			**B2**	**4.8**	
T184	**Ash**	**120, 350**								**Em**	**F/ P**	**F/ P**			**C2**	**3.7**	
T185	**Hawthorn**	**120**								**Sm**	**F/ P**	**F/ P**			**C2**	**1.4**	
T186	**Ash**	**120**								**Y**	**P**	**P**			**U**	**1.4**	
T187	**Ash**	**120, 120**								**Sm**	**P**	**P**			**U**	**1.7**	
T188	**Ash**	**300**								**Sm / Em**	**F**	**F/ P**			**B2**	**3.6**	
T189	**Ash**	**250**								**Sm**	**P**	**P**			**U**	**3.0**	
T190	**Ash**	**120, 180**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.2**	
T191	**Ash**	**350**								**Sm / Em**	**F/ P**	**F/ P**			**C2**	**4.2**	
T192	**Ash**	**250**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.0**	

T193	**Ash**	**180, 180, 180**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.1**	
T194	**Ash**	**260**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.1**	
T195	**Ash**	**200**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.4**	
T196	**Ash**	**170**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.0**	
T197	**Ash**	**230**								**Sm**	**F**	**F/ P**			**C2**	**2.8**	
T198	**Ash**	**220**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.6**	
T199	**Ash**	**100, 140**								**Sm**	**P**	**P**			**U**	**1.7**	
T200	**Ash**	**180**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.2**	
T201	**Ash**	**180, 300**								**Em**	**F/ P**	**F/ P**			**C2**	**3.5**	
T202	**Ash**	**240**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.9**	
T203	**Ash**	**290**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.5**	
T204	**Ash**	**250**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.0**	
T205	**Ash**	**180**								**Y / Sm**	**F/ P**	**F/ P**			**C2**	**2.2**	
T206	**Ash**	**280**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.4**	
T207	**Ash**	**250**								**Sm**	**F/ P**	**F/ P**			**C2**	**3.0**	
T208	**Rowan**	**100 Ave. 6 stems**								**Sm**	**F/ P**	**F/ P**			**C2**	**2.5**	
T209	**Ash**	**150**								**Y / Sm**	**P**	**P**			**U**	**1.8**	

T210	**Ash**	**220**								**Sm**	**F/P**	**F/P**			**C2**	**2.6**	
T211	**Ash**	**200**								**Y/Sm**	**P**	**P**			**U**	**2.4**	
T212	**Ash**	**210**								**Sm**	**F/P**	**F/P**			**C2**	**2.5**	
T213	**Ash**	**250, 300, 450**								**Em**	**F**	**F/P**			**B2**	**6.0**	
T214	**Ash**	**160**								**Y**	**P**	**P**			**U**	**2.0**	
T215	**Horse chestnut**	**230**								**Sm**	**P**	**P**			**U**	**2.8**	
T216	**Horse chestnut**	**300**								**Sm**	**F/P**	**F/P**			**C2**	**3.6**	
T217	**Ash**	**250**								**Sm**	**F/P**	**F/P**			**C2**	**3.0**	
T218	**Ash**	**300**								**Sm**	**F/P**	**F/P**			**C2**	**3.6**	
T219	**Horse chestnut**	**280**								**Sm**	**P**	**P**			**U**	**3.4**	
T220	**Horse chestnut**	**1000**								**M**	**P**	**P**		**Dead.**	**U**	**12.0**	**Fell.**
T221	**Ash**	**380**								**Sm/Em**	**F**	**F/P**			**C2**	**4.6**	
T222	**Ash**	**120**								**Y**	**P**	**P**			**U**	**1.4**	
T223	**Horse chestnut**	**200**								**Y**	**F/P**	**F/P**			**C2**	**2.4**	
T224	**Ash**	**120**								**Y**	**P**	**P**			**U**	**1.4**	
T225	**Beech**	**1000**								**M**	**F/P**	**F/P**			**B2**	**12.0**	
T226	**Ash**	**100, 100**								**Y**	**F/P**	**F/P**			**C2**	**1.4**	
T227	**Sycamore**	**100**								**Y**	**P**	**P**			**U**	**1.2**	

End of table.

5. Proposed Development & Tree Impacts.

5.1 The proposal.

5.1.1 The proposal, **Proposed Site Plan 139990-P101 Rev A by Hawkins Projects**, extract below, shows the proposal. Tree retention is indicative.

5.1.2 The four largest existing buildings are replaced by similar office buildings. A new building is sited to the south west.

5.1.3 Land west of the existing buildings will be made into formal parking areas. Linear parking areas are constructed adjacent to the site's eastern boundary.

5.2 Tree Constraints and Impacts (considered below).

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

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

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

5.3 Physical contact of above-ground parts of trees.

5.3.1 General:-

Tree Plans in Appendices shows tree locations and crown spreads. Crown dimensions: spread in four directions, base of crown and tree height, are given in Table 4.5.2.

5.3.2 Specific above-ground impacts:-

- The proposal requires no tree removal.
- Lime tree group G30 may require occasional crown raising over the site access and parking.
- There is a proposal to make a footpath link to the southern-boundary path. This can be done with no tree impact.

5.4 Below-ground root spread.

5.4.1 General:-

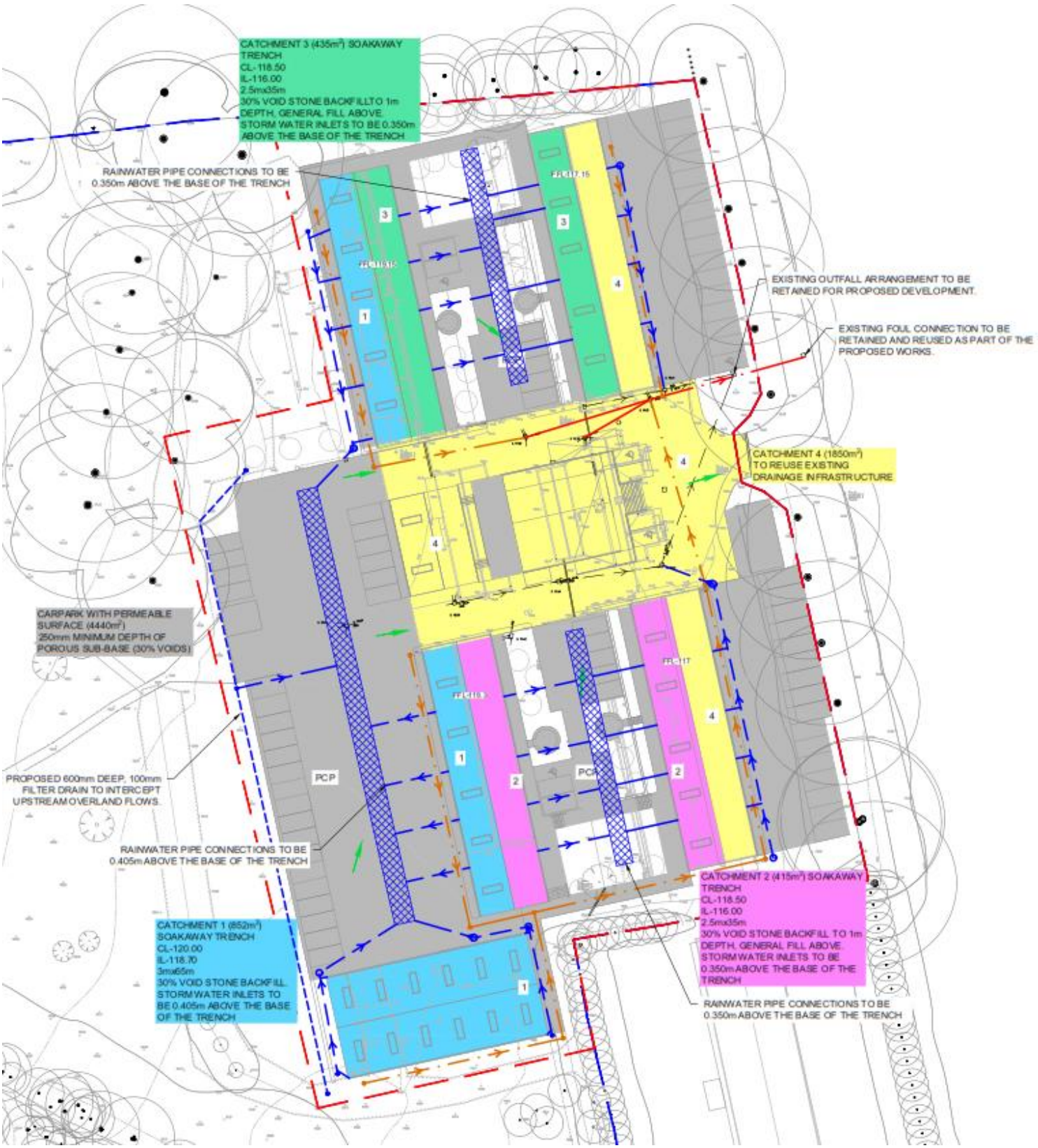
BS5837 defines a tree's Root Protection Area as a circular area of 12 x stem diameter: required to maintain long-term health of a full-canopied tree. We show it as an idealised circle. We think of this as a disc of untouched ground 1m deep. Rooting areas are never symmetrical, but ideally there should be no ground disturbance within the RPA zone. 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 is shown on the RPA plan.

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

5.4.2 Specific Rootzone Impacts:-

- Parking bays along the eastern boundary will be constructed within the RPAs of lime group G30. The ground slopes east from buildings down to trees. So rootzone impact can be minimised using a minimal-dig sub-base and gravel surfacing. See section 6.9 of this report.
- The existing site access is located within the RPAs of lime group G30. The proposal will have no impact on rootzones, *provided that the existing surface remains undisturbed and intact.*
- There is a proposal to make a footpath link to the southern-boundary path. This can be done with minimal rootzone impact.

- Construction access around the buildings is a potential rootzone impact. We show RPAs fenced off. Therefore, to allow more access, **areas of temporary ground protection would be needed.** See 6.6.3. below.
- Link Engineering Drainage Strategy, below, shows porous build up in grey, along the frontage.



5.5 Light Interception & 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 is recommended in BS5837. *This is the shadow pattern for a period from May to September inclusive, from 10.00hrs to 18.00hrs daily.*

5.5.2 Specific Shading Impacts:-

- The buildings will be *slightly* shaded by G30 in the morning and western-boundary trees in late afternoon.
- There are no significant shading implications for these commercial buildings.

5.6 Over-bearing and Falling material.

5.6.1 General:-

All trees drop flower parts, leaves, twigs and fruits throughout the year. These can create a mulch layer on roads. Bird droppings and honeydew can spoil car paintwork. Big trees make adjacent dwellers nervous.

5.6.2 Specific Impacts:-

- Leaves and twigs will be blown across the site from woodland group WG4 and all trees on the west side of the site. This will require periodic clearing of leaves throughout the autumn and winter months.
- Lime group G30 will drop leaves and debris onto parked cars, within the proposed easterly parking bays. This will require periodic clearing of debris and the removal of deadwood from the group's western canopies.
- Lime trees are prone to aphid attack and honeydew production in warm, dry, weather. Cars parked beneath G30 are likely to suffer honeydew deposition in the summer months.
- These impacts can be mitigated by routine maintenance, except for honeydew deposition form G30.

5.7 Subsidence/heave & root growth.

5.7.1 To be assessed by an engineer referring to NHBC 4.2:2020.
Subsoil and geology suggest coarse-textured soils with low volume-change potential.

5.7.2 Therefore, Subsidence or heave should not be issues on this site.

5.8 Amenity impact.

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

- The proposal requires no tree removal, only pruning. Therefore, the proposal's impact on amenity will be minimal.

6. Arboricultural Method Statement in sequential order for proposed development at Hatch End site.

6.1 Supervision

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

6.1.2 **Further** arboriculturalist inspections to supervise/check:

- **Installation of protection fencing.**
- **Installation of minimal-dig parking areas.**

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

6.2 Tree Management

6.2.1 Tree Work prior to ground work:-

Table overleaf……..

6.2.2 Treework informatives, included for general information:-

6.2.2.1 Disturbance to wildlife.

It is essential to check for nesting birds, bat roosts, badgers and hibernating animals such as hedgehogs under trees, before pruning or removing trees, as negligent disturbance is an offence under the EC Habitats Directive 92/43/EEC, Countryside and Rights of Way Act 2000, Protection of Badgers Act 1992. The Conservation (Natural Habitats, & C) (Amendment) Regulations 2007 make ***any*** damage or destruction of a breeding site or resting place of a European Protected species (mainly bats in a tree context) an offence.
In general, autumn tree work: **September, October and November** is least disruptive to bats and birds. Work on very ivy-clad trees may need a formal pre-start bat assessment by a trained bat worker.

6.2.2.2 Permission

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

6.2.2.3 Quality of Tree Work

All off-ground tree work should be done by insured tree surgeon with certificates in aerial chainsaw use (new designations:- NPTC 020-04, 0020-05, 0020-07, 0021-01, 0021-07; LANTRA 600/5703/8, 600/5717/8, 600/5715/5, 600/5704/X, 600/5714/2), and working to BS3998:2010, and *"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 Hatch End:-

No	Species	RPA radius m.	Work for landscape / tree health.	***ADDITIONAL WORK FOR DEVELOPMENT***	
				Specification.	**Reason for additional work for development.**
All	**All**		**See table 4.5.2**	***None.***	

End of table.

(Treework following development see 6.10 below.)

6.3 Tree Protection

6.3.1 Requirement

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

6.3.2 Vertical Tree Protection

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

6.3.2.2 Two **specifications** for suitable protective fencing are given in Appendix II. **Heavyweight fencing needed here.**

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

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

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

6.3.3 Temporary Ground Protection (TGP) within RPAs:-

6.3.3.1 IF work is required to be closer than the all-round protection zone, then the fenced off zone can be made smaller on that side, or entered temporarily, subject to permission from retained arboriculturalist.

Within such zones, temporary horizontal ground protection plus temporary fencing would be essential.

TGP is not needed if fenced-off areas provide adequate construction access.

6.3.3.2 Obvious options for temporary ground protection would be:-

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

6.4 Construction Access.

6.4.1 General points:-

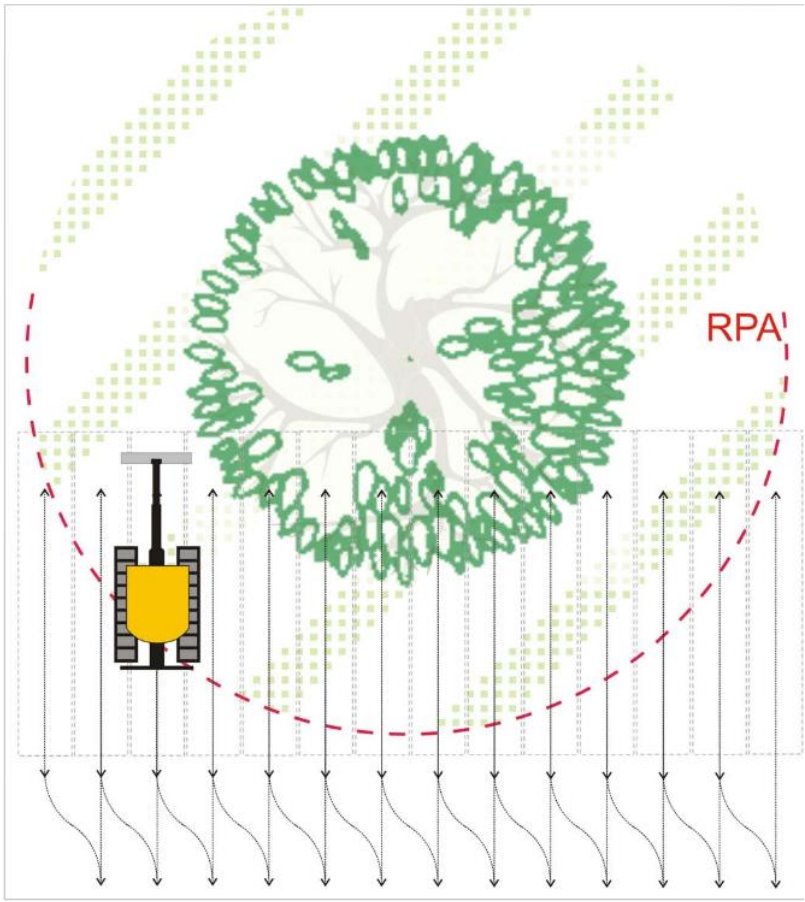
- We assume access will be via the existing access on the easterly boundary. Existing surfacing must remain intact.
- All retained trees and hedges need protection.
- No pedestrian, vehicle, plant or machinery to enter RPAs without temporary ground protection as detailed in para 6.3.3 above.

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 General specification FOR MINOR GROUND LEVELLING, may be required here on eastern boundary:-

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



6.6 Foundations within RPAs:-

6.6.1 No special measures needed for buildings.

6.7 Drainage.

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

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

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

6.8 Service Trenches within RPAs.

6.8.1 Service trenches (electric lights, utilities, telecoms, drains etc) must be d**esigned** to run as far from trees as possible. **Use existing runs.**

6.8.2 Trenches **within RPAs must be avoided.**

6.8.3 Otherwise use this onerous, generalised, work method:-

- Hand digging* or trench-less systems must be used.
  *Use an air-spade to reveal roots (Appendix V).
- Retain roots >15mm diameter within service trenches. Thread service pipe underneath.
- No roots >25mm diameter must be exposed or severed without express written permission of local authority tree officer or retained arboriculturalist.
- Any excavation within the RPA of a tree must be covered immediately after digging with damp hessian, topped by tarpaulin & plyboard, to prevent root desiccation.
- Hole must be backfilled within five days of opening.

- Wrap exposed roots >20mm with hessian, and surround by 50mm depth sand, as part of backfill medium.
- Tamp backfill material by hand thumper or whacker plate only.

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

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

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

6.9.2 New parking bays west of G30:-

Minimal dig systems are provided in various depths. The depth required is determined by existing soil bearing capacities and proposed traffic loadings. Advice should be sought from the the product provider.
However, installation should follow the basic methodology outlined below.

- Remove existing vegetation using methodology in 6.5 above, to maximum depth 100mm.
- Lay a 300g/m^2 needle-punched, non-woven, geotextile onto the existing ground surface.
- Lay thin layer of 5-20mm clean angular stone to level.
- Install a 3D cellular confinement system, typically 100mm depth, on top of the geotextile (eg Cellweb).
- Infill the system with a 5-20mm clean angular stone and aid settlement, using a whacker plate only.
  For parking bays:
- Top up the system ensuring that there is 25mm surcharge across the surface. This could be the finished surface, with plastic studs to demarcate parking bays.
  For access drives:
- If required apply a permeable hard surface in consultation with a surfacing engineer.
- Or add 40mm plastic reinforcement trays (example in appendices) and fill with similar graded clean aggregate for carpark surface.

6.9.3 Appendix IV gives materials for minimal-dig, porous, build-up.

6.10 Tree work following construction.

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

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

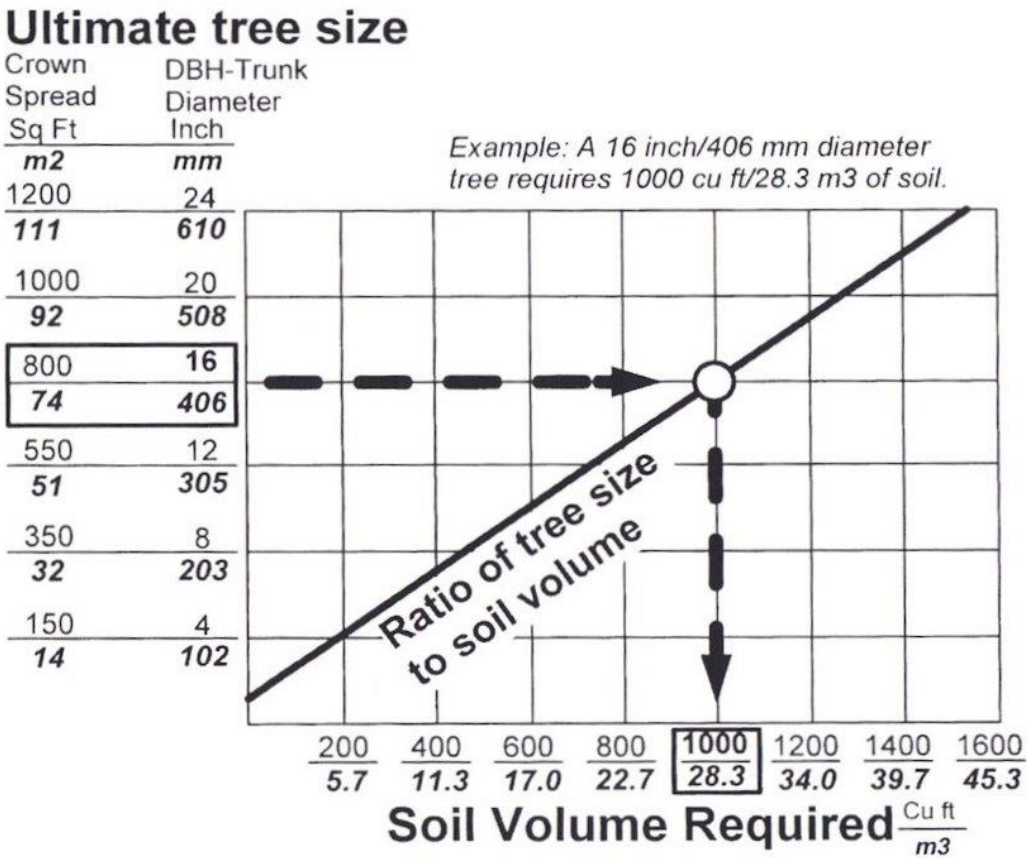
6.11 New Planting.

6.11.1 The site contains many tree, and no further tree planting is required.

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

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

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



7.0 Conclusions

7.1 The proposed re-development of Hatch End Industrial Estate requires no tree removal. It does require occasional minor pruning to keep trees in harmony with the proposal.

7.2 Carpark construction within the RPAs of off-site limes G30, requires the use of a minimal-dig sub-base. See 6.5 & 6.9 above.

7.3 The site contains a large number of trees. No further planting is proposed or required.

Please contact us for further information.
Yours sincerely,

B J Unwin Forestry Consultancy.

References:

"The Body Language of Trees". Claus Mattheck and Helge Breloer. HMSO 1994.

"Principles of Tree Hazard Assessment and Management". David Lonsdale. HMSO 1999.

BS 3998: 2010 "*British Standard Recommendations for Treework*".

BS 5837: 2012 *"Trees in Relation to Design, Demolition & Construction".*

BS 8545 "*Trees: from nursery to independence in the landscape* – Recommendations". BSI 2014.

NJUG Volume 4 2007 "*Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees"*. NJUG, 30 Millbank, London,SW1P 4RD.

"Trees and Development". Nelda Matheny and James R Clark. ISA. 1998.

BS 8206:1992 "*Lighting for buildings*" .

BRE guide 209 (2002) "*Site Layout planning for daylight and sunlight*" .

NHBC Chapter 4.2, *Building Near Trees*. National House Building Council, 2013.

"*Tree Roots in the Built Environment*". J Roberts, N Jackson & M Smith. R.A.T.8, TSO (The Stationary Office), London, 2006.

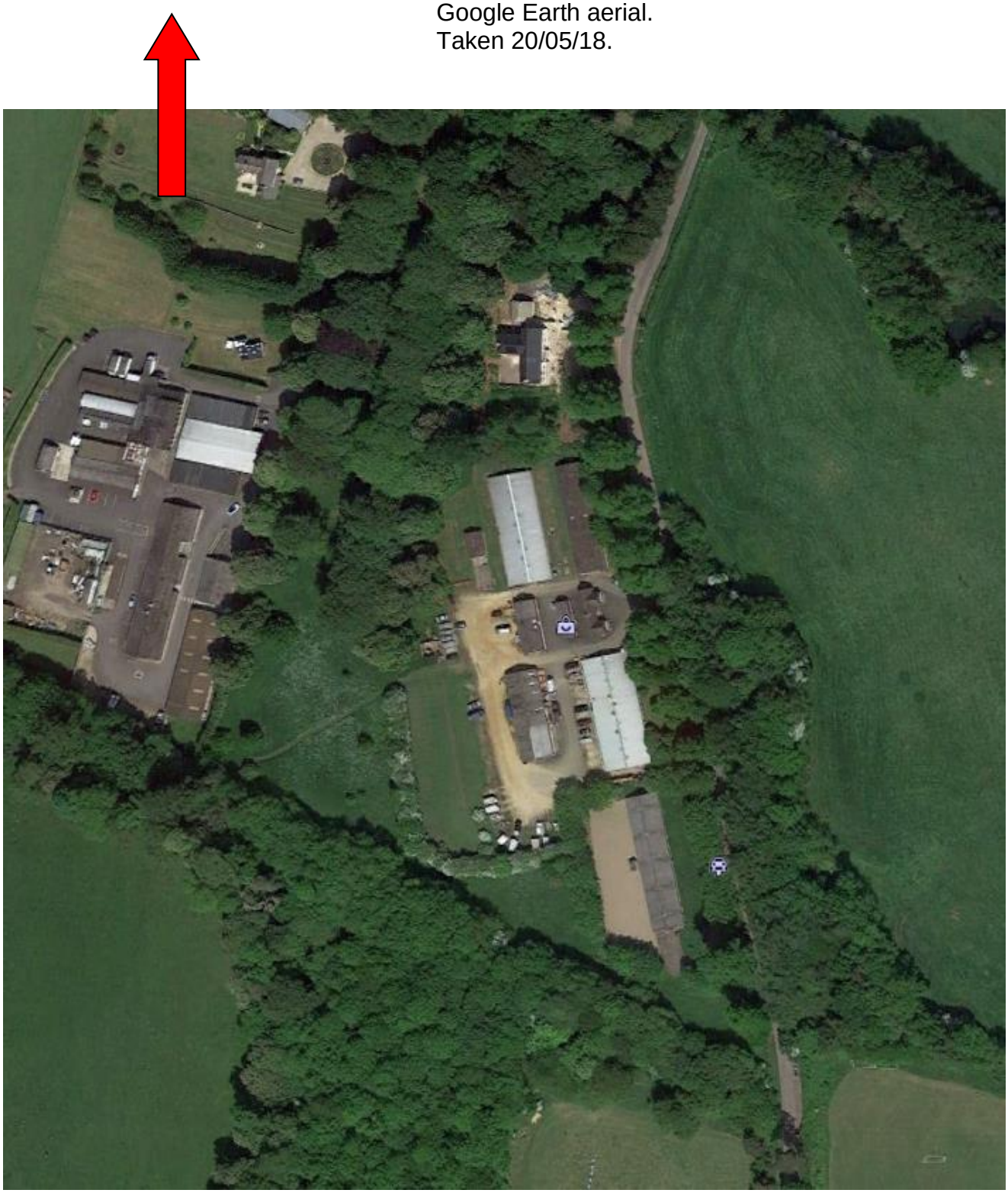
"Treework at Height" Industry Code of Practice. Arboricultural Association. 2014.

"The Use of Cellular confinement Systems near Trees". Guidance Note 12, 2020. ArboriculturaL Association.

Appendix I


Location
Well
Spr
90
80
Middle Aston House
Lakeside Farm
Hatch End Industrial Estate
100
Sch
Motel

Google Earth aerial.
Taken 20/05/18.



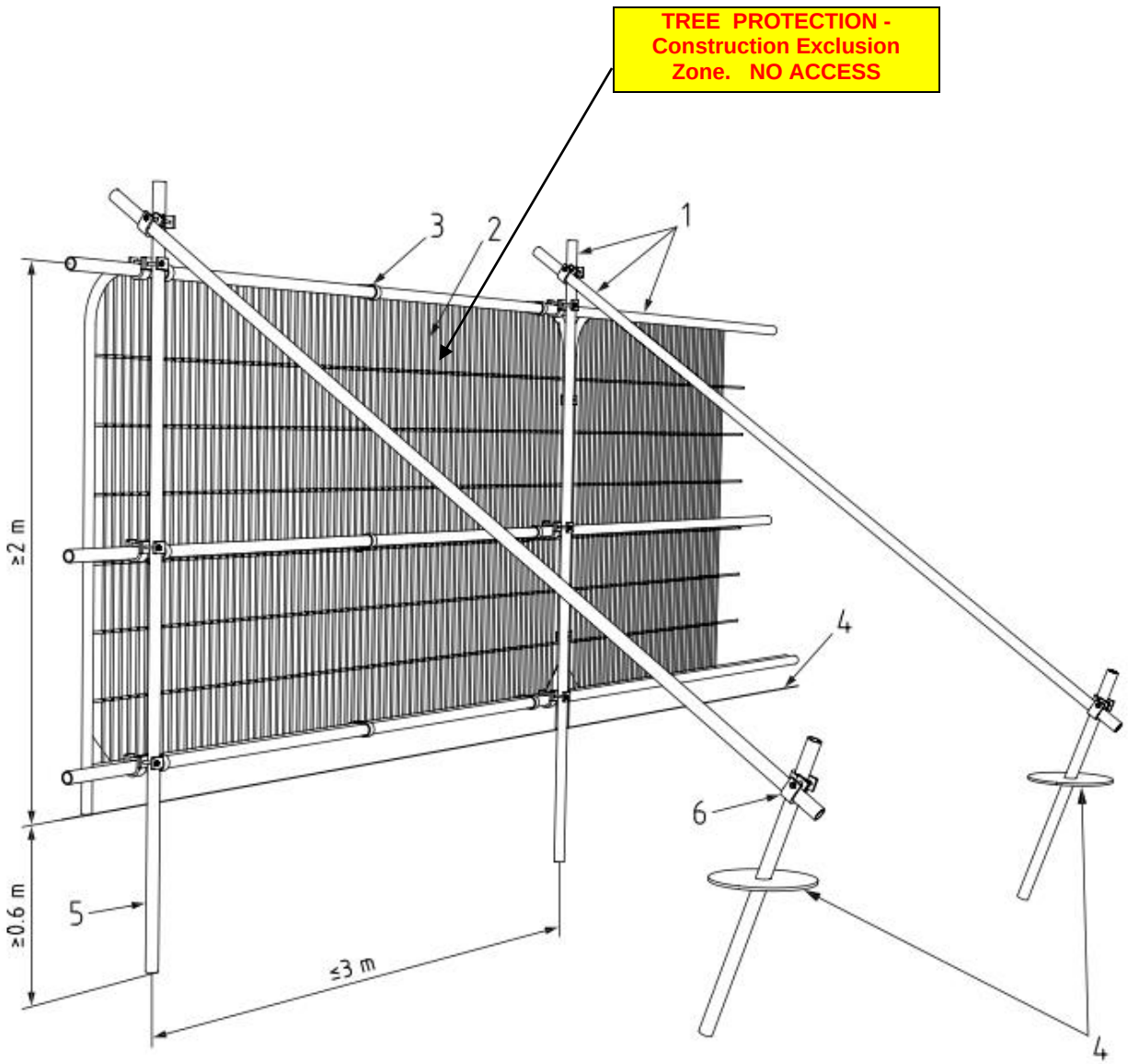
Appendix II

Vertical Tree Protection Fencing, from BS5837.

Vertical protective fence: location on plan:

Default in situ > 3 months:-
Heras panels on driven poles, + braces on driven poles.

Apply signs at MAX 10m spacing:



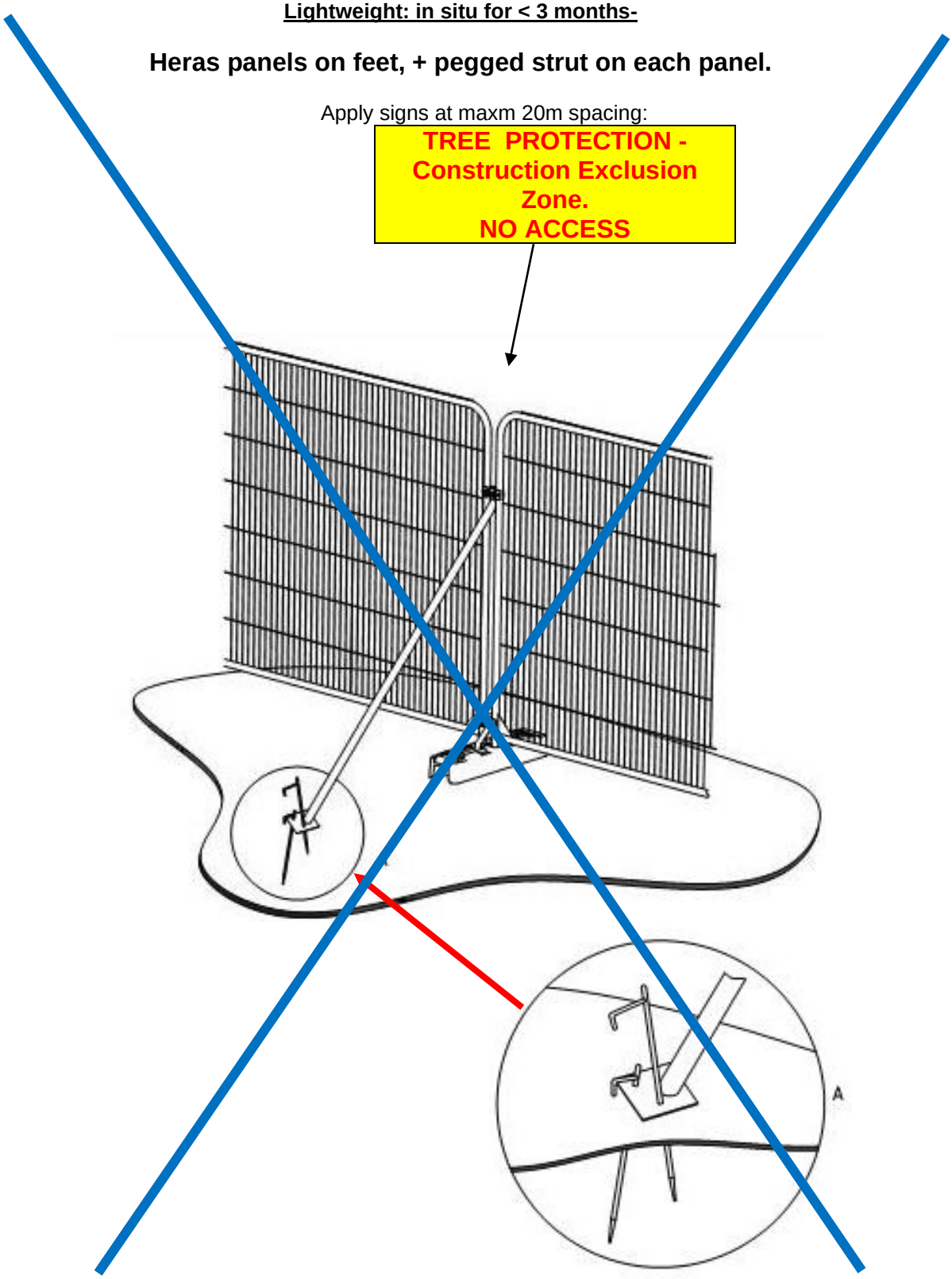
Key

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

Lightweight: in situ for < 3 months-

Heras panels on feet, + pegged strut on each panel.

Apply signs at maxm 20m spacing:



Appendix III

Horizontal Ground Protection x 2 examples

Example of aluminium temporary ground protection.

EVE TRAKWAY

Roadways - Medium Duty Trakpanel

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

The Benefits:-

Pedestrian friendly upper surface

Suitable for heavy vehicles Ideal for where both pedestrians and vehicles require safe passage.

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

The following Roadways are available.

Please select an item to view more information:

Other Roadways products:-

Heavy Duty Trakpanel-

LD20-

Roadway Ramps-

Multi-Directional Trakpanel

Example of plastic temporary ground protection.

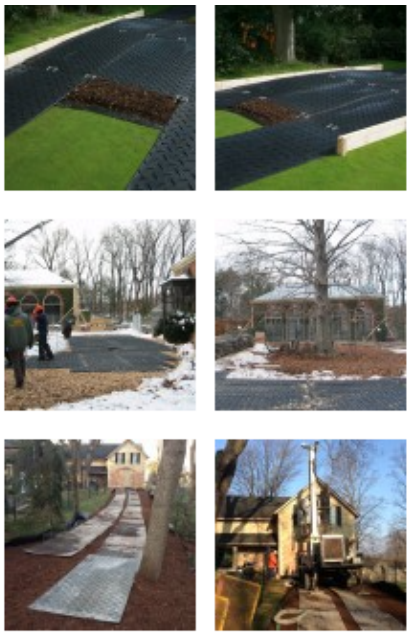
Ground-Guards Tree Root Protection

Tree root protection for construction projects

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

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

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



Appendix IV

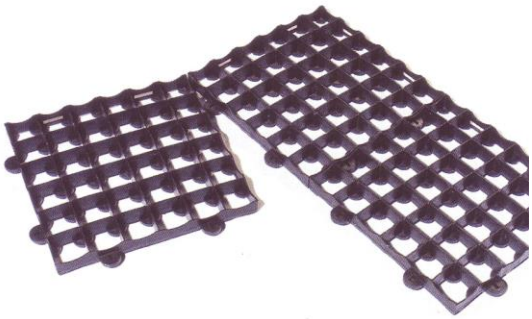
Trays for strengthening gravelled or grassed areas. (50mm or 80mm trays for strengthening gravelled or grassed areas.

DuoBlock

Grass Protection System



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



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

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

Applications:

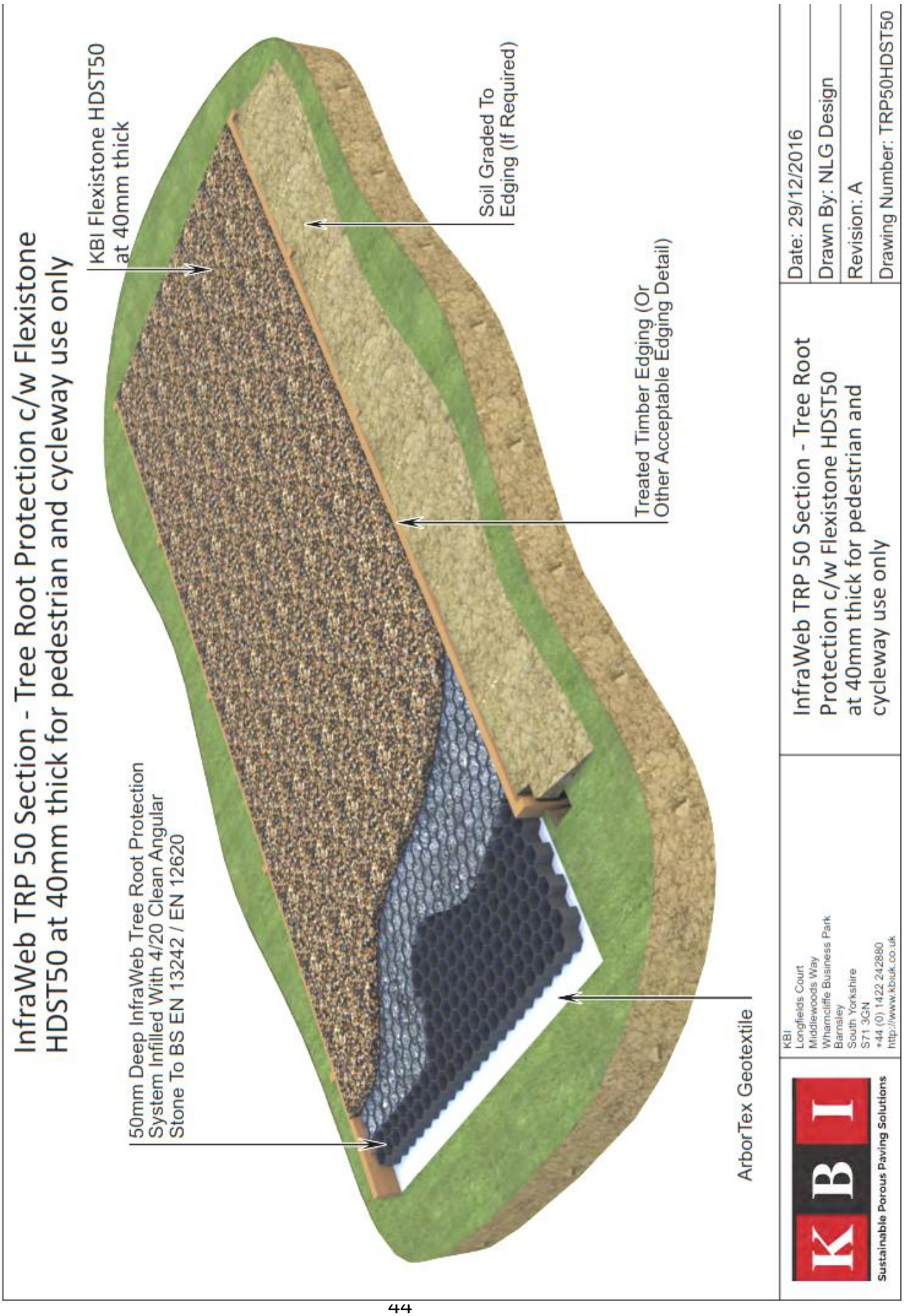
- Overspill car parking
- Emergency access and service roads
- Caravan hardstanding
- Verge hardening
- Service Roads
- Pedestrian walkways and towpaths
- Bridle ways
- Helipads
- Golf course pathways / Tee reinforcement

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

Benefits:

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

NEXT DAY DELIVERY from stock


InfraWeb TRP 50 Section - Tree Root Protection c/w Flexistone
HDST50 at 40mm thick for pedestrian and cycleway use only
KBI Flexistone HDST50
at 40mm thick
Soil Graded To
Edging (If Required)
Treated Timber Edging (Or
Other Acceptable Edging Detail)
50mm Deep InfraWeb Tree Root Protection
System Infilled With 4/20 Clean Angular
Stone To BS EN 13242 / EN 12620
ArborTex Geotextile
KBI
Longfields Court
Middlewoods Way
Wharncliffe Business Park
Barnsley
South Yorkshire
S71 3GN
+44 (0) 1422 242880
http://www.kbiuk.co.uk
Sustainable Porous Paving Solutions
InfraWeb TRP 50 Section - Tree Root
Protection c/w Flexistone HDST50
at 40mm thick for pedestrian and
cycleway use only
Date: 29/12/2016
Drawn By: NLG Design
Revision: A
Drawing Number: TRP50HDST50

Deeper Cellweb 3-D grid for strengthening tracks.

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

Cellweb® TRP Key Functions

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

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

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

The Cellweb® TRP system comprises the following three components

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

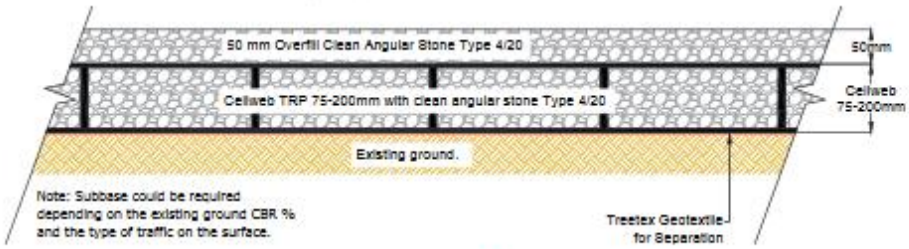
Cellweb® 3D Cellular Confinement. The Cellweb® is installed on top of the Treetex™ layer. This is fixed to the ground using ten steel J pins per panel. The panels can be cut to the required shape and adjoining panels can be connected using heavy duty staples or cell ties.

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

Which depth of Cellweb® TRP?

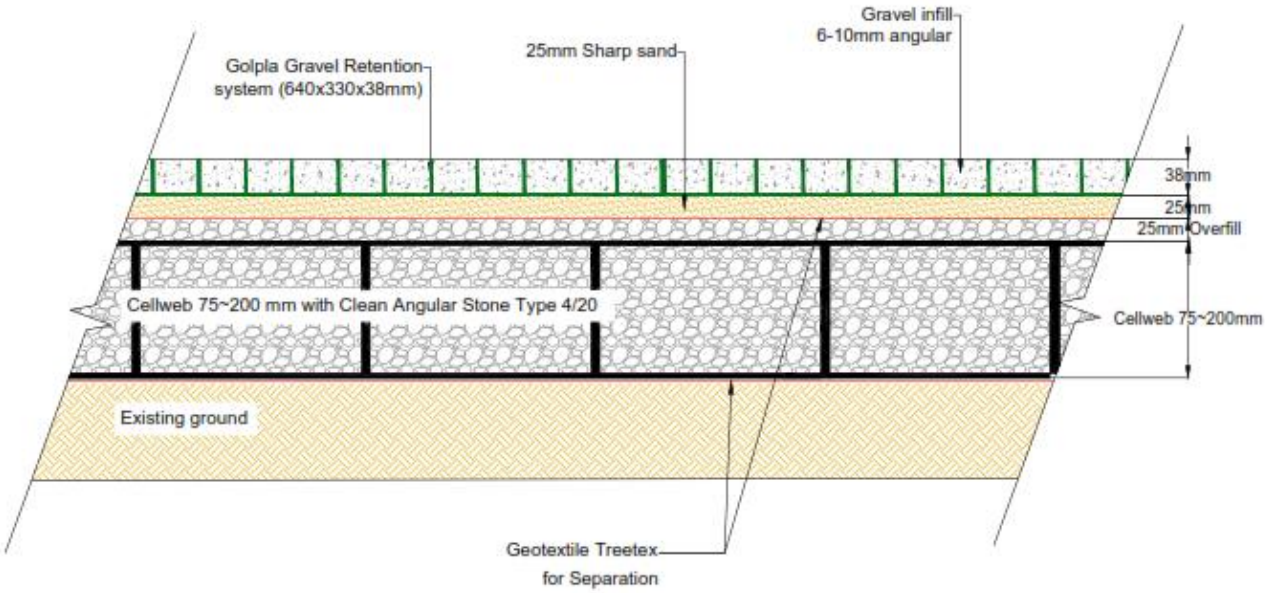
The Cellweb® System is provided in four different depths; 200mm, 150mm, 100mm and 75mm. The depth required is determined by the proposed traffic loadings and the site ground conditions. Geosynthetics in house engineering department can provide a free site specific technical recommendation. For free technical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

Indicative Cellweb with overfill

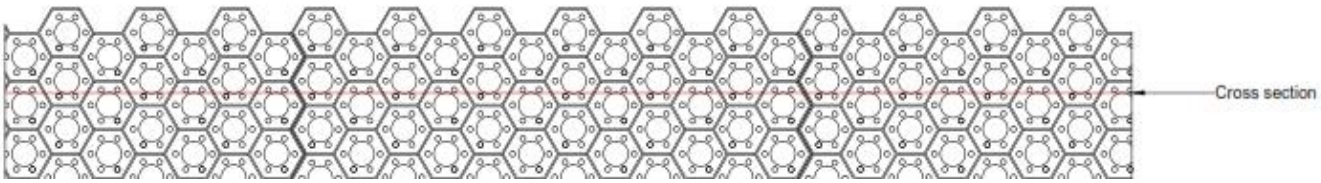


Web: www.geosyn.co.uk | Tel: 01455 617139
Fax: 01455 617140 | Email: Sales@geosyn.co.uk

Geosynthetics
Engineered Solutions



Note: Subbase could be required depending on the existing ground CBR % and the type of traffic on the surface.



Appendix V

Example of Air-spade.

HANDLE VIBRATION TEST

Product type – MBW Soil Pick SP125

Manufacturer of testing apparatus – Castle

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

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

Hand/arm vibration = 0.0M/S2

TREE CARE

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

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

Aeration & Excavation

Root Locating for Utility Line Installation or Pruning

Investigating Root Structure and Damage

Transplanting or Bare Rooting

Reducing Soil Compaction

Appendix VI

- B J UNWIN FORESTRY CONSULTANCY 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**
Satellite Offices: - Haley Ridge, Highcliffe**, Nr. Wadebridge, Cornwall**, PL27 6TN.
-105 Charfield Court, 2 Shirland Road, **London**, W9 2JR.
Associate office: - 1 Market Place Mews**, Henley-on-Thames, Oxfordshire,** RG9 2AH.
Principal: **Jim Unwin BScFor, MICFor, FArborA, RCArborA, CEnv.**
Chartered Forester - ICF Registered Consultant - Fellow of the Arboricultural Association - Arboricultural Association Registered Consultant - Chartered Environmentalist.

From:	**Jim Unwin**	*To:*	**Prospective Client**
Date:	**Feb21**	*No. of pages:*	**2**
Subject:	**Professional CV**		

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

Insurance:-

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

Personnel:-

B J Unwin (born 1956) started his forestry career as a tree surgeon and landscape contractor in 1975. He studied forestry at Aberdeen University from 1977 to 1981, worked for Unilever as a Forestry Manager in the Solomon Islands from 1981 to 1983. Since then he has been based in Gloucestershire assisting clients to manage their woodland, trees and vegetation throughout Southern Britain, and occasionally in northern England, Scotland and Northern Ireland.
In the mid-1980s to mid-1990s for a period of about ten years he taught chainsaw, tree felling and tree surgery courses at Worcestershire Agricultural College on a part-time basis. He was assessed and passed as a LANTRA assessor in these skills, and held NPTC certificates of competence in chainsaw use on the ground and up trees.
He now works as a tree consultant / manager / contract manager to a range of clients listed below.
For tree decay testing we have a **PICUS II ULTRASOUND** tomograph with electronic callipers and **RESISTOGRAPH-R400** drill.
He works with two self-employed arboriculturalists of >20 years' combined experience:-
Jasper Fulford-Dobson Arboricultural Association Registered Consultant - Associate Member of the Institute of Chartered Foresters - Professional member of the International Society of Arboriculture - Technicians Certificate (ArborA) 2005, now regarded as NQF "level 4" - Professional Tree Inspection Certificate (LANTRA) 2013,
Owen Hutchison BSc(Hons) Agriculture & Estate Management, Level 4 Diploma Arboriculture, LANTRA Professional Tree Inspection & working with trees since 2007.
Plus a secretary/ plan technician; calling in extra help as required (eg ecologist or arboricultural assistant). On bigger projects he regularly works as a part of a multi-disciplinary team.

Current BJUFC qualifications are:-
BSc Forestry Hons 1st Class, Aberdeen 1981.
Chartered Forester No. 0330064, 1986.
Fellow of the Arboricultural Association, 1995.
Licensed Subsidence Risk Assessor, 1997-2001 (scheme closed in 2001).
Completed Training in September 2002 to Prepare Native Woodland Plans for CCW and FC in Wales.
Arboricultural Association Registered Consultant No. 42, 2004.
LANTRA certificate for Arboriculture and Bats, BJU in 2005.
Examined and approved to submit Welsh WGS as Management Planner and PAWS Assessor, 2006.
Joined Utilities Vendor DataBase, Supplier No: 88101 in Feb 2006 (left 2010).
Training and Certification in basic CAD operation 2006.
Chartered Environmentalist April 2008.
Woodfuel Production and Supply : LANTRA Certificate of Training Dec 2008.
Training in CAVAT amenity tree asset valuation October 2010.

Company Safety Policy:- We have been successfully assessed by Safety Management Advisory Services (SMAS) as meeting CDM Regs 2015 Core Criteria Stage 1, as a ***Worksafe Consultant No. 75950.*** expiry 09/2020.
CITB *Health, Safety & Environment Test for Managers & Professionals* passed 22/01/2015.
First-aid at work June 2013.
DBS Basic Certificate P0003GX9B7C dated 10th Jan 2021 Certificate 998259275.

Current clients and typical work include:-

English Heritage	Tree safety inspection contract 2007-2013 for East Midlands, East Anglia, London and SE England. Tree safety inspection contract for West of England & Midlands 2013-2021.
Planning Inspectorate (**PINS**) & Dept for Communities and Local Government. 2000-2017.	**Arboricultural Inspecting Officer** in South-West England, South East England, West Midlands and East Midlands; advising the First Secretary of State on TPO appeals since 2000. Contract with DCLG expired April 2008 when transferred to PINS. Contract continued with PINS, as Non-Salaried **Arboricultural Inspector, determining TPO appeals and High Hedge appeals. All non-salaried inspectors released in 2017.**
Architects / Developers / Planning Appeals	Complete Tree Constraints, Impact Assessment & Tree Protection advice for planning, working with other professionals to input arboriculture into more complex development schemes. Recent assignments in Liverpool to 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 VII

Constraints plans :-

- **Tree Plan**

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

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

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

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

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

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

and

- **Root Protection Areas Plan**

RPA = circles.
See Tree Table for dimensions.

and

- **Theoretical Shading Plan**

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

Plans are not included in pdf format of report.

Insert plans here in paper copy of report:-

Appendix VIII

Tree retention and Tree Protection Plan.

Plans are not included in pdf format of report.

Insert plans here in paper copy of report:-

END.