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## **Tree survey to BS5837:2012 at xxxx**

**Dr. Richard Wilson**, PhD, Tech. Cert. (RFS), Prof. Dip. Arb (RFS), M. Arbor A., Associate member of the Institute of Chartered Foresters

**Client:** xxxx

**Instruction:** The instruction was received from xxxx. The initial enquiry was received by e-mail on July 25<sup>th</sup>, 2017 with an instruction to proceed received on July 26<sup>th</sup>. Inspection took place on August 4<sup>th</sup>, 2017. A survey of the trees according to BS5837:2012 for construction planning is required.

**Regulatory framework:** Survey carried out according to BS5837:2012 (BSI, 2012), HSE SIM 01/2007/05 (HSE, 2007) & Common sense risk management of trees (Forestry Commission, 2011).

**Techniques:** Visual Tree Assessment (VTA; Lonsdale, 1999), desk-based enquiries (TPO / CA status, geological survey, mapping), THREATS analysis (Forbes-Laird, 2010).

**Limitations:** 1. The contents are intended for the sole use of the client. It is also understood that the document will be shared with his architects, the local planning authority and other professionals connected with the proposed development. No liability is accepted for their use by any other parties to advance an argument or claim (including legal or financial) without prior consent. 2. No liability is accepted for defects hidden from view by soil, vegetation or other obstacles to access. 3. Formal assessment of topography, drainage, service conduits, & soil conditions have not been made and are beyond the scope of this report. 4. Specific laboratory investigations of soil properties (plasticity index, moisture content, soil suction pressure) have not been made and are beyond the scope of this report. 5. This report considers only the potential for the trees to influence the proposed development as described in the site layout plans provided by the client, and / or to cause damage or injury under normally expected weather conditions within the limits of the instruction. No liability for damage arising from any other source or mechanism is accepted. 6. This report will be deemed to be invalid if a history of vegetation related subsidence damage in this or surrounding properties exists but has not been made known to the surveyor. 7. This report considers risk mitigation measures, as opposed to risk elimination. Thus, if any given tree is retained, a level of risk will remain. 8. The plans contained in this report should not be used for detailed site planning or setting out. The positions of trees with respect to buildings and other site features are approximate and should be confirmed by on-site inspection. 9. It is understood that any risks associated with these limitations are accepted by the clients.

**Weather conditions:** Sunny, still.

**Access conditions:** Access was unhindered.

**Background information:** None relevant.

**Validity:** Plants are biological organisms & change with time. Assessment remains valid for 12 months from the date of inspection, or until a major storm (Wind Force 6 +) is experienced.

**Situation:** The property occupies a level site at an elevation of approximately 75m (OS Maps, 2017) in a suburban setting immediately to the southwest of the Midland Main Line, and 500m to the west of xxxx. This is a relatively un-exposed location in the lea of a series of low hills rising to approximately 116m approx. 0.6km to the southwest, and 132m approx. 1km away in xxxx village centre. Surface deposits are of London Clay (BGS, 2017), confirmed in borehole xxxx carried out 200m to the southeast. Soil type is described as a slowly permeable, seasonally wet, slightly acid but base-rich clay loam of moderate fertility (LandIS, 2017). These soils are associated with a high risk of soil shrinkage and an elevated risk of windthrow in water-saturated areas.



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**References:**

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- British Standards Institute (2012). BS5837:2012 – Trees in relation to design, demolition and construction - Recommendations. BSI Publications, London.
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- Lonsdale, D. (1999). Principles of Tree Hazard Assessment and Management. The Stationery Office, London.
- National Tree Safety Group (2011). Common sense risk management of trees. The Forestry Commission, Edinburgh.
- Ordnance Survey (2017). OS Maps service at <https://www.ordnancesurvey.co.uk/osmaps/> Ordnance Survey, Southampton.

## BS5837:2012 Tree survey &amp; recommendations

Date:		04/08/2017		Site:												Conditions:		Sunny, still.				
Client:												Surveyor:		R.J.Wilson								
Assessment																						
Ref. No. (T/G/W/H/HR)	Tree Species	Ht (m)	Stem diameter (0.5m to 10m; whole m thereafter)					Crown spread				Canopy		Life stage (Y,SM,EM,M,OM,V)	Health (G,F,P,D)	Observations	ERC (<10,10+,20+,40+)	QA Category (A,B,C,U)	Urgent recommendations			
			Stem count	1	2	3	4	5	N	E	S	W	Ht. 1st branch							Ht. canopy		
T001	Spindle	5	2	120	150						3	1.5	2.5	2.5	1 W	2	M	G	Bush-like form. Twin stemmed to 50cms then multi-stemmed. Attractive though otherwise unremarkable.	10+	C2	
T002	Silver birch	9.4	1	410							3.5	5	5	3	2.6 W	1.5	M	G	Attractive tree with a full, healthy crown and few defects. Good form and condition. Stem sweeps into upright by 2m. Small rib to E at 0.5-1.5m. Decayed wound from removal of large branch at 0.5m N - sounding hammer returned normal sounds. Crown pruned to improve clearance over hose to S & W - occasional minor deadwood stubs. Level change (0.75m) with retaining wall down to patio 2.5m to SW. Not clearly visible from street.	20+	B1	
T003	Midland thorn	4	1	245							2.5	2.5	2	0	0.75 SE	1.5	M	F	relatively under-developed but encroaching heavily on neighbouring garden. Otherwise unremarkable. Pressure on fence unlikely to be tolerated for a significant period.	<10	U	Fell to prevent damage to fence.
T004	Blackthorn	5	1	80							1	2	2	2.5	1 W	1.5	SM	G	Young tree of good form and condition. No significant defects and generally unremarkable although with some value as an ecological food source. Forms hedge together with T005 - 008. Low value.	40+	C2	
T005	Hawthorn	5	1	80							2.5	2	2.5	3	1.5 S	2	SM	G	Young tree of reasonable form and condition. No significant defects and generally unremarkable although with some value as an ecological food source. Forms hedge together with T004 & 006 - 008. Low value.	40+	C2	
T006	Hawthorn	5	1	75							0.5	2	2	2	1.5 W	2	SM	G	Young tree of reasonable form and condition. No significant defects and generally unremarkable although with some value as an ecological food source. Forms hedge together with T004, 005, 007 & 008. Low value.	40+	C2	
T007	Hawthorn	5	1	65							1.5	1	1.5	1	1.5 W	2	SM	G	Young tree of reasonable form and condition. No significant defects and generally unremarkable although with some value as an ecological food source. Forms hedge together with T004 - 006 & 008. Low value.	40+	C2	
T008	Cherry plum	5	2	40	30						1	0	3	2.5	1 NW	2.5	SM	G	Young tree of reasonable form and condition. No significant defects and generally unremarkable although with some value as an ecological food source. Forms hedge together with T004 - 007. Low value.	40+	C2	
T009	Cherry plum	6.5	5	210	120	80	100	120			5.5	0	1.5	5.5	0	1.5	M	G	Reasonable form and condition for species. Multi-stemmed from ground level with twisting, inter-twined stems. Asymmetrical crown. Stem leans by 20° to NW.	20+	C1	
T010	Lawson's cypress	4	2	100	120						1	1	1	1	0	1	EM	P	Unattractive tree with a bush-like form and sparse crown. Likely suppressed by T009. Diameter estimated at 0.5m due to form. Low value tree.	<10	U	
T011	Lawson's cypress	5	1	80							1	1	0	0	1 N	1	SM	P	Unattractive tree with brown dying foliage and dense variegated ivy cover. Partial inspection only. Likely suppressed by T009. Low value tree.	<10	U	
T012	Sugar maple	6	1	185							3	4	3	3	1.5 N	2.5	EM	G	Attractive off-site tree. No significant defects but lacking special qualities of Cat A.	40+	B1	

Ref. No. (T/G/W/H/HR)	Tree Species	Ht (m)	Stem count	1	2	3	4	5	N	E	S	W	Ht. 1st branch	Ht. canopy	Life stage (Y,SM,EM,M,OM,V)	Health (G,F,P,D)	Observations	ERC (<10,10+,20+,40+)	QA Category (A,B,C,U)	Urgent recommendations
T013	Cider gum	15.8	1	295					3	3.5	2	2	4.5 N	4.5	EM	G	Attractive tree of good form and condition and only minor defects. Stem arises with 15° lean to NE but sweeps to upright by 2.5m. Could develop into attractive amenity tree of future. Currently lacking special qualities of Cat A.	40+	B1	
T014	Atlas cedar	6.5	1	130					2	1.5	2	1	0.5 E	0	SM	G	Recently planted tree of good form and condition. No significant defects. Could develop into attractive amenity tree of future. Currently lacking special qualities of Cat A.	40+	C1	
T015	Sycamore	11	1	370					2	2	5	4	2 W	3	M	F	Arises as single-stemmed tree and bifurcates at 1.25m - union stable and non-included. Crown asymmetrical but healthy and full. Basal decay extending into root plate and extending upwards into stem. Rail line behind fence but crown weighted in opposite direction with off-site oak tree behind.	<10	U	Fell tree within 4 weeks.
T016	Hawthorn	7	4	110	160	195	145		3	2	3	5	1.5 S	1.5	M	G	Spreading multi-stemmed tree with twisting , inter-twined limbs typical for species. Crown asymmetrical but of reasonable form and condition. Minor deadwood.	20+	C2	
T017	Weeping willow	9.5	1	465					2	6.5	8.5	9	3 S	1.5	M	G	Attractive well-maintained tree of good form and condition. Stem leans by 30° to S. Asymmetrical crown but otherwise no significant defects. Lacking special qualities of Cat A.	40+	B1	
T018	Hawthorn	5.5	1	230					3	3	4	3	1 E	2	M	F	Spreading multi-stemmed tree with twisting , inter-twined limbs typical for species. Crown asymmetrical but of reasonable form and condition. Minor deadwood. Dense ivy to 4m. Partial inspection only.	20+	C2	

**Tree Numbering:**

Trees identified by individual tags are listed according to their tag numbers  
 Trees not tagged are prefixed with the letter 'T'  
 New plantings (less than five years in situ) are prefixed with the letter 'P'

**Tree age classes:**

Y - young  
 SM - semi-mature  
 EM - early mature  
 M - mature  
 OM - over mature  
 St - Senescent  
 V - veteran

**BS5837 tree retention category:**

A - High quality trees with a life expectancy of >40 years  
 B - Trees of moderate quality with a life expectancy of >20 years  
 C - Trees of low quality with a life expectancy of >10 years OR trees with a stem diameter below 150mm  
 U - Trees with a life expectancy of <10 years under the current system of land use.  
 1 - mainly arboricultural qualities  
 2 - mainly landscape qualities

## BS5837:2012 Tree survey & recommendations

<b>Date:</b>	04/08/2017	<b>Site:</b>		<b>Conditions:</b>	Sunny, still.
<b>Client:</b>				<b>Surveyor:</b>	R.J.Wilson

### Assessment

Ref. No. (T/G/W/H/H R)	Tree Species	Plant count	Ht (m)	Average stem diameter	MRCS	Ht. 1st branch	Ht. canopy	Life stage (Y,SM,EM,M,OM, V)	Health (G,F,P,D)	Observations	ERC (<10,10+,20 +,40+)	QA Category (A,B,C,U)	Urgent recommendations
G001	Black cherry plum	2	5.5	280	3.5	1.5	2	M	G	Off-site closely-planted pair of trees with shared form and companion shelter. Good form and condition and no significant defects. Reasonably attractive trees. Borderline Cat B/C - trees small and part of hedge-like group but are a definite asset and therefore elevated out of Cat C.	20+	B1	
G002	Cherry plum	2	7.5	305	4	0	0	M	G	Closely planted pair of trees with shared form and companion shelter. Multi-stemmed with dense epicormic growth at base. Part of linear planting at edge of orchard area. Twisting inter-twined and leaning boughs arising at ground level. Reasonably attractive trees.	20+	B1	
G003	Apple, Pear, Plum, Crab apple	11	5.5	240	3	1.5	1.5	M	G	Orchard trees of good form and condition and well maintained with regular pruning. Trees have a good fruit crop and form a valuable and attractive feature.	40+	B1	
G004	Hawthorn	3	6.5	250	3	1.5	2	M	F	Group of generally multi-stemmed trees forming a hedge with moderate ivy cover. Of generally untidy appearance and unremarkable. Low value trees.	20+	C2	

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 'Groups are prefixed with the letter 'G'

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 1 - mainly arboricultural qualities  
 2 - mainly landscape qualities  
 3 - mainly cultural / conservation qualities

**BS5837:2012 Tree survey & recommendations**

<b>Date:</b>	04/08/2017	<b>Site:</b>		<b>Conditions:</b>	Sunny, still.
<b>Client:</b>		<b>Surveyor:</b>	R.J.Wilson		

**Assessment**

Ref. No. (T/G/W/H/H R)	Tree Species	Length (m)	Ht (m)	Mean width (m)	Mean Stem Diameter (mm)	Life stage (Y,SM,EM,M,OM,V)	Health (G,F,P,D)	Observations	ERC (<10,10+,20+,40+ )	QA Category (A,B,C,U)	Urgent recommendations
H001	Leyland cypress	19	4	1.5	25	SM	G	Screening hedge inside wood panel fence. Recent planting of good form and condition. No significant defects.	40+	C2	

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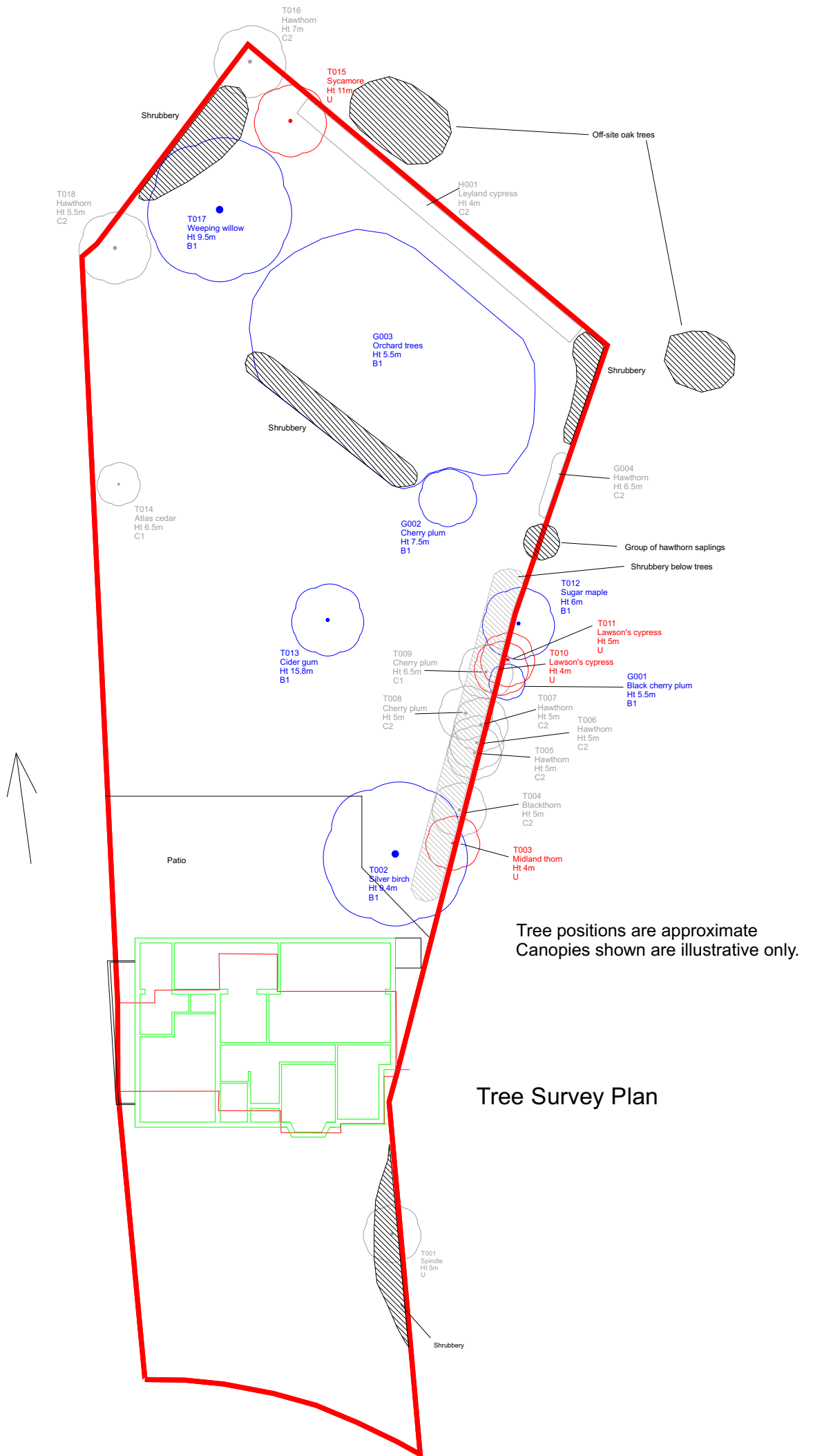
C - Trees of low quality with a life expectancy of >10 years OR trees with a stem diameter below 150mm

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Tree positions are approximate  
Canopies shown are illustrative only.

Tree Survey Plan



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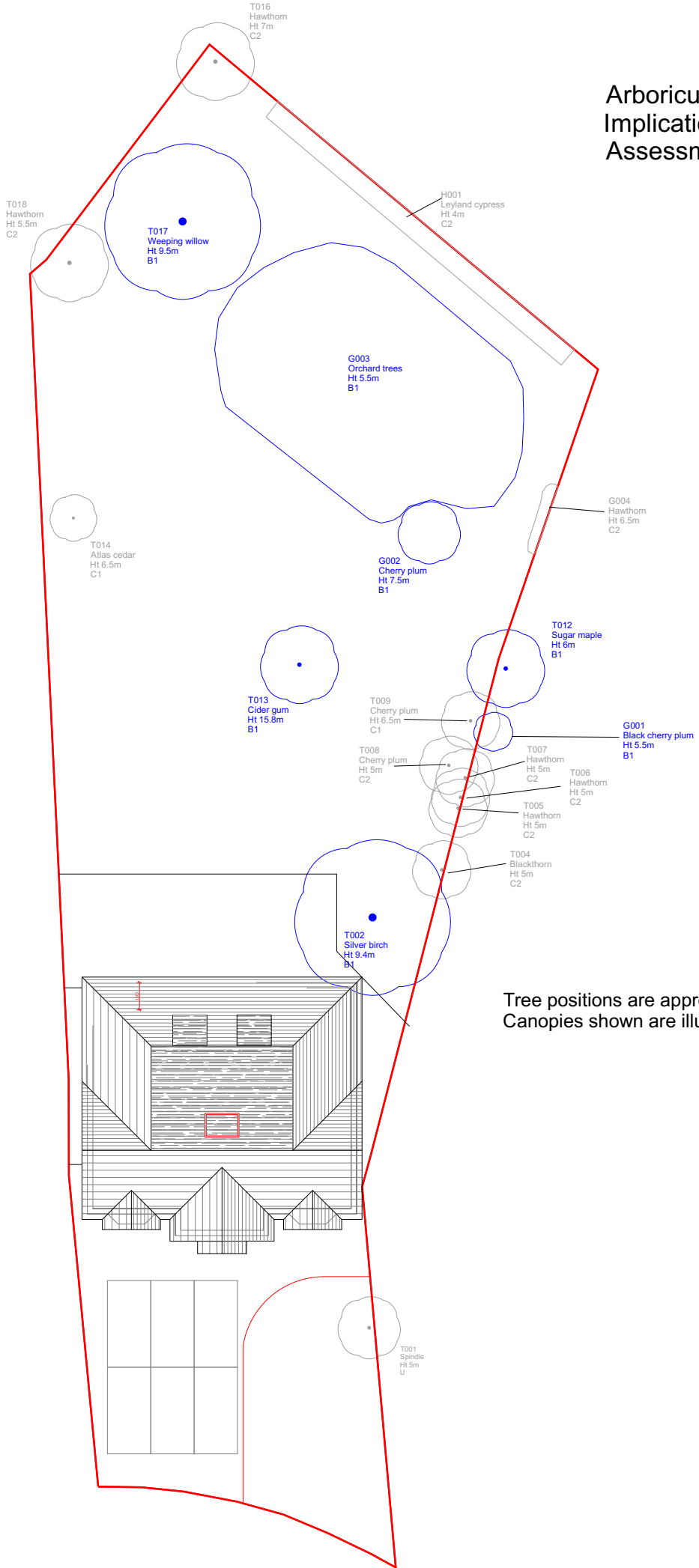
### **Arboricultural Implications Assessment:**

- The site is currently affected by a total of 18 individual trees, 4 tree groups containing approximately 18 trees and one domestic hedge.
- Trees to remove:
  - The following trees have been assessed as Category 'U' (retention for >10 years not realistic) and should be felled:  
T003, 010, 011 & 015 (4 trees; 11%).  
With the exception of T003 these are sufficiently far from the proposed development to be unaffected by it.
- Trees to retain: all other trees may be retained (89%).
- Trees to the north of T002 are sufficiently far from the proposed development to be unaffected by it and have not been considered further.
- Access facilitation pruning to lift the crown of T002 above the proposed new roof line will be required. This should be carried out sympathetically in late summer by suitably competent arboriculturists.
- AIA plan based on site drawing '335-SK16\_17 trees' received from xxxx by e-mail on 27/07/2017 and overlaid on the tree survey plan. The client advises that the location of a new patio and soft landscaping is under consideration and expressed a strong desire to retain T002. I have therefore proceeded using the location of the existing patio and retaining wall.
- Plan key: Green: Category A trees; Blue – Category B trees; Grey – Category C trees; Red – Category U trees.

Labels show tree number, retention category, species and height in metres.



# Arboricultural Implications Assessment



Tree positions are approximate  
Canopies shown are illustrative only.

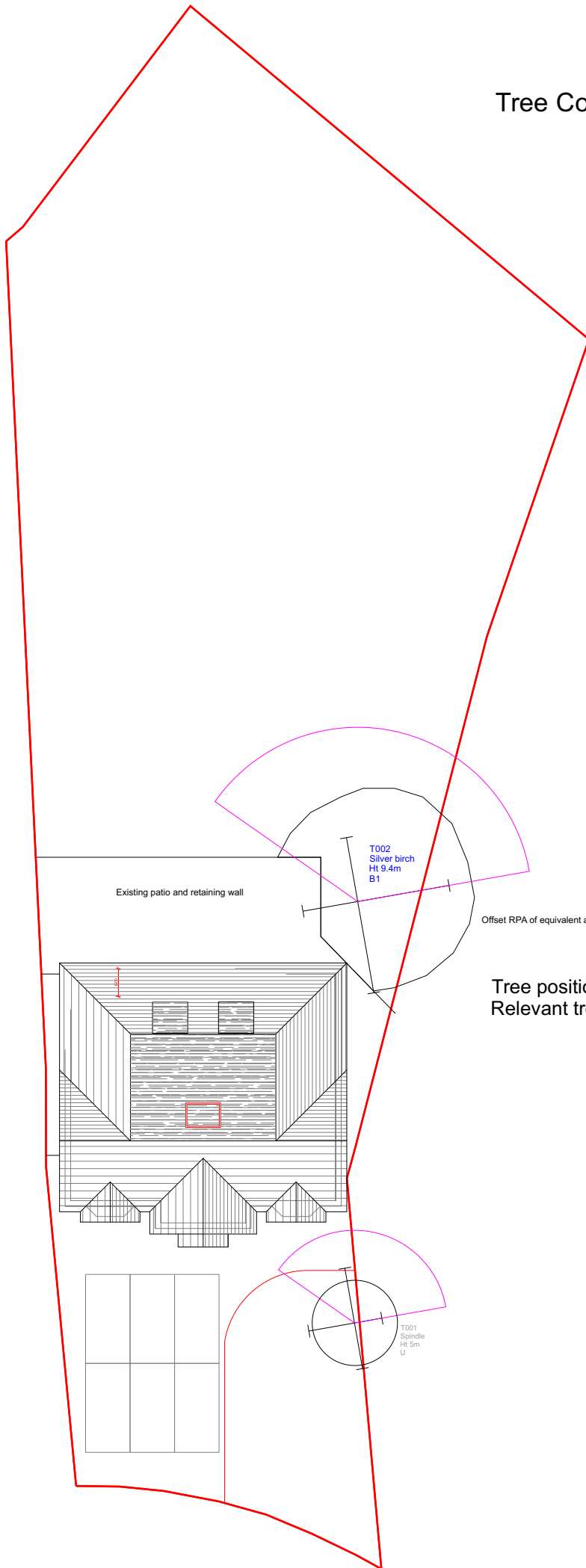


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### Tree Constraints Plan:

- Root protection areas are indicated on the Tree Constraints Plan in black. Due to the presence of the patio retaining wall, an offset RPA of equivalent area has been drawn for T002.
- Root Protection Area (RPA) encroachment: The proposed development will not result in new permanent encroachment into any RPAs.
- The crown of T002 is expected to overhang the NE corner of the proposed new building and the need for Access Facilitation Pruning has already been noted (above).
- Shade arcs are drawn on the Tree Constraints Plan in magenta. The proposed design would not be subject to unacceptably high levels of shading.
- Retained trees can be expected to create large amounts of leaf litter, seed cast & fallen fruit but these are sufficiently far from the building and hard surfaces so as not to present any particular issues.
- Design & construction constraints.
  - Demolition: Where demolition takes place within 5m of T002 it is to proceed from within the footprint of existing buildings using 'pull-back' techniques.
  - Foundations: The presence of a deep London Clay soil raises the possibility that seasonal soil shrinkage may be encountered on this site. Sleeved micropiles of the smallest size suitable for the proposed structure may be required. Where piling takes place within 5m of T002, the piling rig is to stand within footprint of existing building.
  - Services for the dwelling should be laid in a single common service trench passing under the proposed driveway and positioned outside RPAs to minimise root damage; soakaways etc. to be positioned outside RPAs.
  - Satellite TV reception can be expected to be adequate.
  - Tree protection barriers to be used to protect trees and RPAs as per BS5837:2012 and as described in the Tree Protection Plan, below.
  - Vehicles, building materials, waste piles / skips, and building activities are to be excluded from the Construction Exclusion Zones.
  - Site offices and storage areas may be conveniently sited on the parking area at the front of the site.
  - Particular care is to be taken to avoid run-off from building activities (e.g. cement washings, fuel, chemicals and additives) entering construction exclusion zones.

# Tree Constraints Plan



Tree positions are approximate  
Relevant trees only shown for clarity

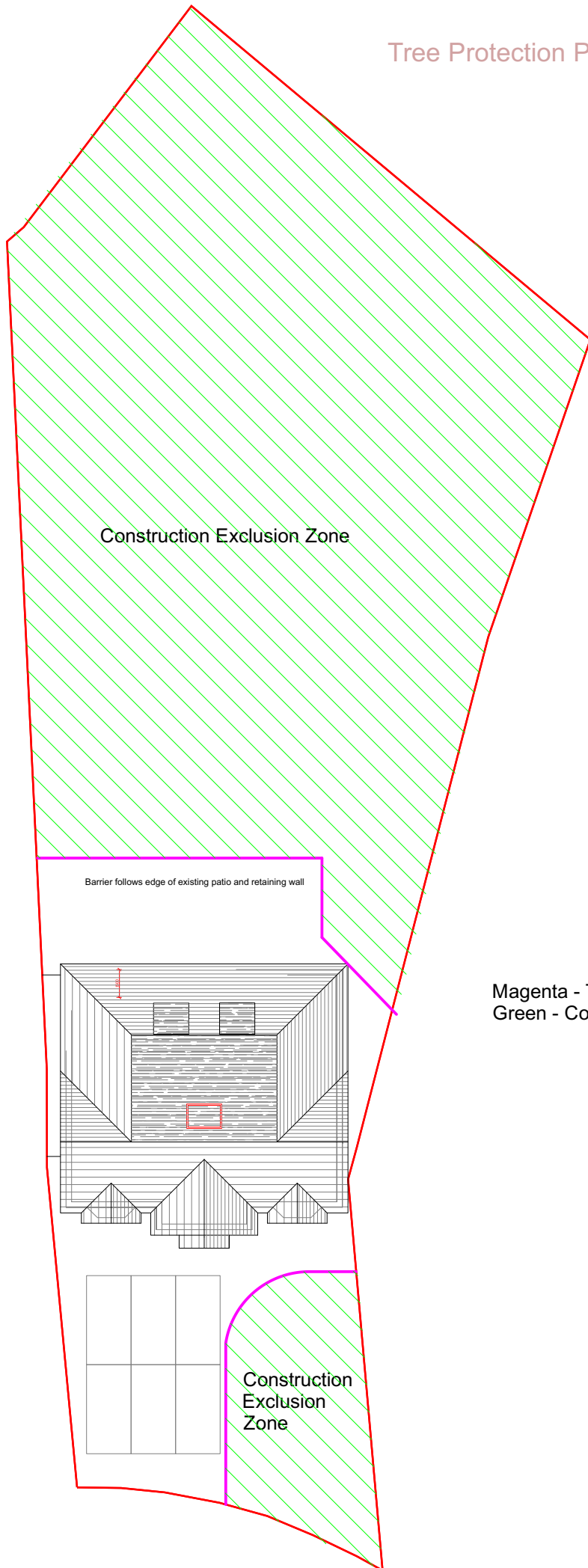


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### Tree Protection Plan:

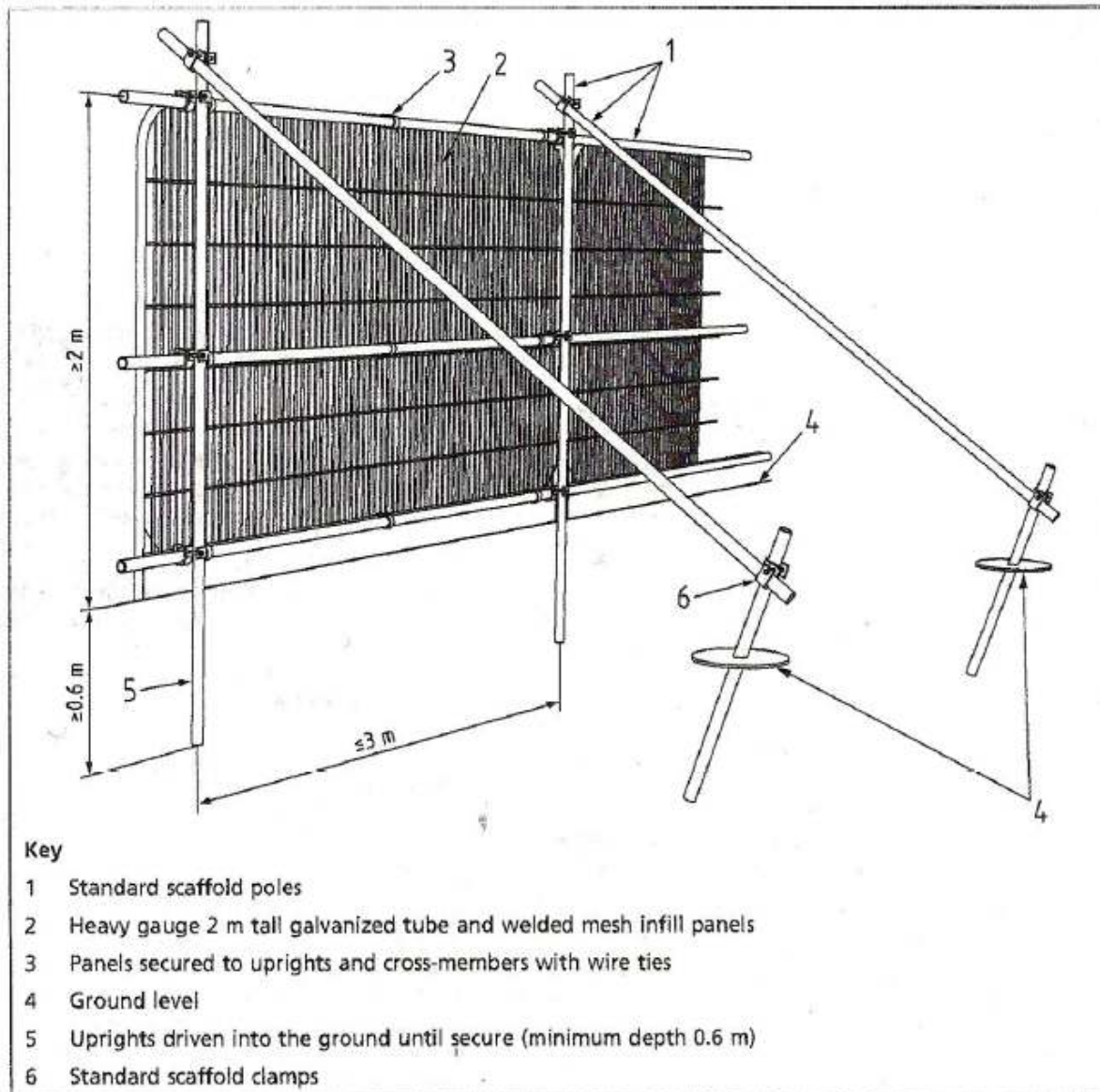
- Tree protection barriers have been drawn on the TPP.
- Plan key: Tree Protection Barriers shown in magenta; Construction Exclusion Zones are shown in green hatched shading.
- Areas enclosed by barriers or lying to the outside of the barriers (with respect to the development site) are 'Construction Exclusion Zones'. No activity of any kind, including storage and / or preparation of materials, siting of fires, toilets or cabins may proceed within the CEZs.
- Tree protection barriers should be constructed as detailed in BS5837:2012 clause 6.2 as described and illustrated below (coloured magenta on the plan):
  - "6.2.2.1 Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.
  - 6.2.2.2 The default specification should consist of a vertical and horizontal scaffold framework, well-braced to resist impacts, as illustrated in Figure 2. The vertical tubes should be spaced at a maximum interval of 3m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturists that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.
  - 6.2.2.3 Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturists and, where relevant, agreed with the local planning authority. For example, 2m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence panels should be joined together with a minimum of two anti-tamper couplers, installed so that they can only be removed from the inside of the fence. The distance between the fence couplers should be at least 1m and should be uniform throughout the fence. The panels should be supported on the inner side by stabiliser struts, which should normally be attached to a base plate secured with ground pins (Figure 3a). Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabiliser struts should be mounted on a block tray (Figure 3b).
  - 6.2.2.4 All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE – NO ACCESS".

# Tree Protection Plan



Magenta - Tree Protection Barriers  
Green - Construction Exclusion Zone

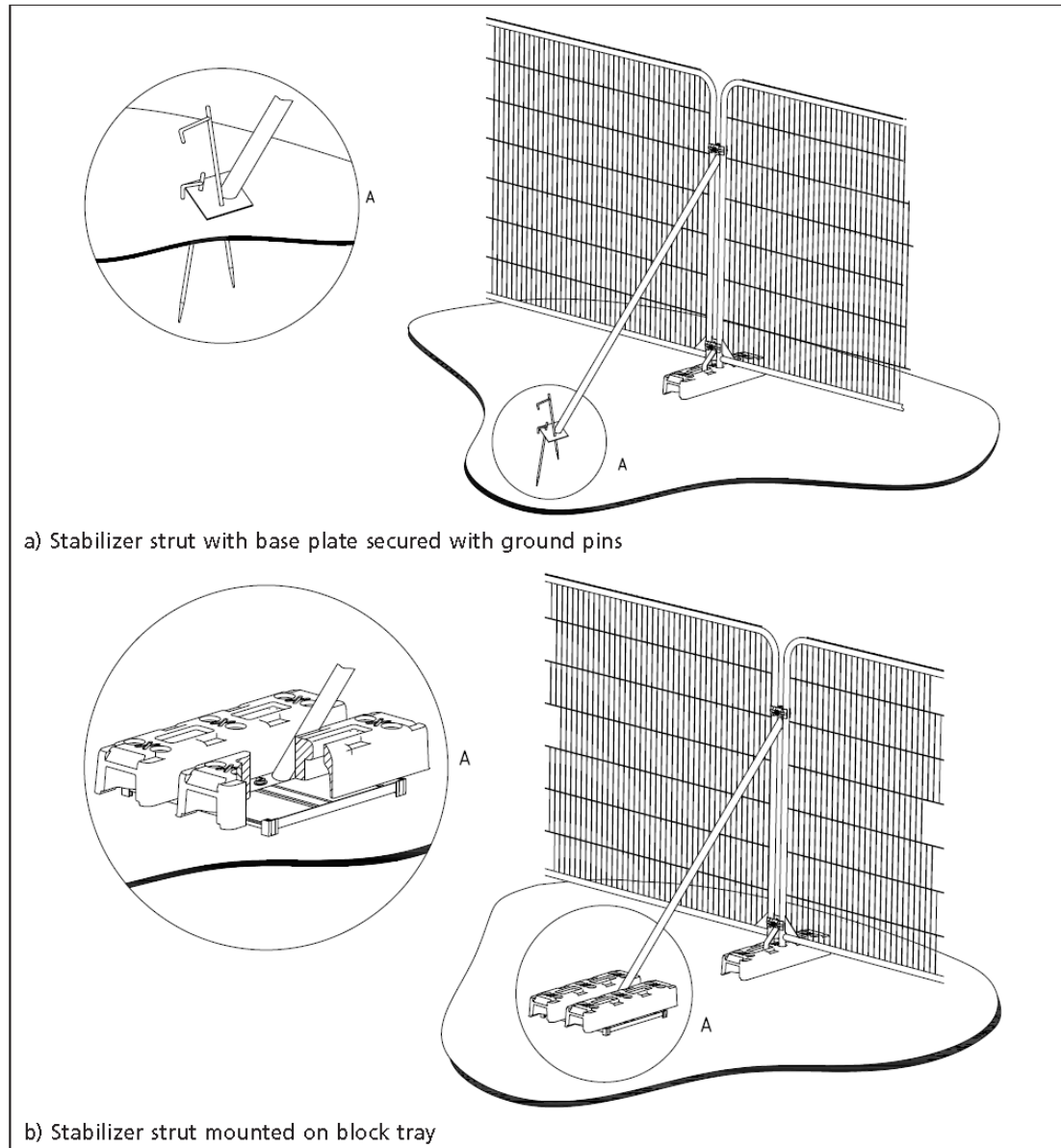
Figure 2 Default specification for protective barrier





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Figure 3 Examples of above-ground stabilizing systems



a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray