Site Specific Arboricultural Survey, Impact & Method Statement

Land at 8 Lindfield Gardens, London NW3 6PX

Richard Wassell MIHort NDArb(RFS)Kew Diploma NEBOSHlevel3
26th March 2013

Office: 15 Norcombe House, Wedmore St., Islington N19 4RD

Tel: 07860 445380

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Client

Mr. David Gillerman and Mrs. Karin Gillerman

Scope of Report

This document has been produced to provide a detailed survey of trees within and surrounding the above site demise and that are nearby to the proposed planned development.

The scope of this report follows the recommendations and guidance described within *BS 5837:* **2012** *Trees in Relation to Design, Demolition and Construction – Recommendations* which sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.

The report will assess the quality, amenity and landscape value of all surveyed trees and describe the protection of all trees to be retained and where they are likely to be affected by the proposed development construction activities. The report will also indicate the likely impact the proposals may have on those trees in the future.

The report will also recommend any required tree works to enable access and also to mitigate potential damage in the future.

This is intended to support the planning application for development of this site.

The tree survey for the site can be found in Addendum 3 below

Abbreviations:

RPA = root protection area

CEZ = construction exclusion zone

CWA = construction working area (including materials storage)

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Arboricultural Impact Assessment

Proximity of Proposed Development to existing Trees

Ref: Addendum 1 - Table 1, Addendum 3 and Picture Gallery at end of report

The important Horse Chestnut tree T1 situated on the first terrace level in the rear garden will not be affected by the proposed basement and extension to the rear, provided that construction works are carried out at no closer than 1 metre back from the existing retaining wall of the terrace.

A trial pit was excavated by hand on 19th March 2013 just behind the existing first level retaining wall in order to determine the level of rooting for the Horse Chestnut tree T1 in the zone closest to the proposed basement and first floor extension. The trial pit was 3 metres wide by 1 metre deep and dug at 9 metres from the centre of tree T1 stem. The excavation revealed short and secondary Horse Chestnut roots all of less than 25mm in diameter at a density of no more than 5% in the pit profile. All roots were within the top 600mm of the trial pit. *Please see pictures at end of report for the trial pit evidence*

The resultant outcome is that it will be safe to create a new first level retaining wall at 9.5 metres from the centre of the stem of T1 at the closest point to the proposed construction to avoid damage to the RPA of the tree. *Please see detail plan below*

The terrace retaining wall should remain as long as possible but when required to be re-built (including steps) this shall have a specific method statement to ensure that no damage occurs to any roots behind the steps area..

The Purple Plum tree T3 is an unremarkable tree and is likely to be severely affected by the proposal and it is thus proposed to remove and carry out replacement planting, if required.

The remaining trees T4 to T13 within the rear garden and front garden of the property will not be affected by the proposals.

Arboricultural Method Statement

Ref: Addendum 1 & 2

This method statement shall be seen as provisional for planning purposes and subject to a detailed submission once proposals are agreed and to conform to any specific conditions made.

Excavation within RPA of Retained Trees

Ref: Addendum 1

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The re-construction of the first level retaining wall shall be constructed at 9.5 metres from the centre of the stem of T1 and as described above in the impact assessment.

Construction of the basement and ground level extension shall be further away from the tree T1 than the new retaining wall to prevent any potential damage to the root system of the tree.

The proposed development does not affect any other retained trees on the site.

* Please see addendum 1 section on Excavation within RPA of retained trees.

Tree Protection Barriers & Construction Exclusion Zone

The tree protection barrier shall be erected on site set-up and will define the construction exclusion zone, which is to be the whole of the rear garden beyond the first terrace retaining wall level.

This is designed to protect the RPA of both trees T1 and T4 from construction activity

*Please see specification for tree protection barriers shown below

Ground Protection of Existing Surfaces within Root Protection Area (RPA) of Nearby Trees

Ref: Addendum 1

None required

Access Facilitation Pruning & Tree Works

Ref: Addendum 2

The schedule of tree works and replacement planting are shown below.

Site Access and Construction Working Area (CWA)

Site access point and CWA has not been confirmed at time of writing this report but likely to be from Lindfield Gardens both through and down the side of the existing house

Site Storage and Accommodation

These areas shall be outside of the construction exclusion zones for the retained trees and not within the RPA of trees at the front of the property.

Installation of Services

Arrangements for this element of the development of the site are unknown as at time of writing this report but are likely to remain as existing.

Changes to the service routes will be carefully considered using the AS below to advise on protection of nearby trees prior to commencement on site.

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Arboricultural Supervision (AS)

AS shall be required during work within and adjacent to the RPA of retained trees. It must be undertaken at regular intervals with a written record of the meetings maintained and photographs taken if required.

The AS must include a pre-construction commencement site visit, to be arranged by the Site Manager under instruction from Architects, and thereafter at intervals of not less than 3 weeks until completion of construction works or more regularly if found necessary by site requirements.

Conclusion

Provided the recommendations shown above and the methodology for protection of any retained trees are followed, there will not be an affect on the current or future condition of those trees that are retained as part of the proposed scheme.

Tree Grading Categories

Ref: Grading Category as per BS 5837:2012 Section 4.5 Table 1 & Table 2 – Tree quality assessment chart. Tree Survey Schedule in Addendum3 below for description of trees categorized

The grading categories are based on the following criteria:

A=high quality (1/2/3)

B=moderate quality (1/2/3)

C=low quality (1/2/3)

U=trees of such a condition that they cannot realistically be retained as living trees in the context of the current land use

1 = mainly arboricultural qualities

2 = mainly landscape qualities

3 = mainly cultural values, including conservation

Trees categorized within this report:

1 Category A trees = T9

2 Category B trees = T1, T7, T11

3 Category C trees = T3, T4, T5, T6, T8, T10, T12, T13

4 Category U trees = T2

Trees for removal on this site:

1 Trees = T2 & T3

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References

- 1. BS 5837:2012 Trees in Relation to Design, Demolition and Construction Recommendations
- 2. BS3998:2010 Tree Work Recommendations
- 3. NJUG Volume 4 Issue2 2007 Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees.
- 4. NHBC Standards Section 4.2 Building Near Trees
- 5. British Geological Survey London & the Thames Valley
- 6. Principles of Tree Hazard Assessment Lonsdale 2001
- 7. Diagnosis of Ill Health in Trees Stouts & Winter 2004
- 8. Picture Gallery at end of report
- 9. Tree Survey Plan at end of report
- 10. Finkernagel & Ross Architects Drawings: site existing and LIN100/LIN101

Declaration

This Tree Survey and AMS have been written and checked by Richard Wassell of Wassells Arboricultural Services Ltd. and are provided without prejudice as an objective and professional assessment of the trees described.

Signed: R.J. Wassell Date: 26.03.MMXIII

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Addendum 1

Ref: BS 5837:2012 in Tables C.1 & D.1of annex C & D

Table 1 - Tree protection measurements

Table 1-11ee protection measurements								
Tree Number As per tree survey plan & schedule	Stem Diameter @ 1.5 metres agl. Millimetres	Root Protection Area (RPA) - Radius *measured from centre of stem* Metres	Tree/Root Protection Area (RPA) Sq. Metres	Affect of building proposal on the total RPA				
T1	1000	Off-set by 2 metres in NE direction to allow for terrace and change in level	452	Not affected if proposed construction works do not go any closer than 1 metre back from existing retaining wall				
T2	120	1.2	5	Removed				
ТЗ	150, 170 & 200	3.6	41	Likely to be heavily impacted and is proposed for removal and replacement if required				
T4	320	3.9	48	Not affected				
T5	420	5.1	81	Not affected				
T6	600	7.2	163	Not affected				
T7	350	4.2	55	Not affected				
T8	250	3	28	Not affected				
T9	700#	8.4	222	Not affected				
T10	400	4.8	72	Not affected				
T11	350	4.2	55	Not affected				
T12	400	4.8	72	Not affected				

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Tree Number As per tree survey plan & schedule	Stem Diameter @ 1.5 metres agl. Millimetres	Root Protection Area (RPA) - Radius *measured from centre of stem* Metres	Tree/Root Protection Area (RPA) Sq. Metres	Affect of building proposal on the total RPA
T13	3x300	6	113	Not affected

Protecting Root Zone of Trees (BS 5837:2012 section 6.2 Figs. 2 & 3):

The Root Protection Area (RPA)

This is the area surrounding a tree that is deemed to contain sufficient roots and rooting volume to maintain the trees viability in the future. The root system is typically concentrated in the uppermost 600 – 1200mm of the soil and is not necessarily symmetrical around the tree, being dependant on a number of factors such as water, nutrients, oxygen, soil penetrability and physical obstructions such as existing foundations or changes in level (terracing).

The RPA is a design layout tool that is deemed to be a minimum area around a tree where the protection of roots and soil structure are treated as a priority. This area is envisaged as and portrayed with a circle around each tree but where there appears to be restrictions to root growth the circle is reshaped to reflect more accurately the likely distribution of the rooting area of the tree concerned.

Key Points

- 1. AVOID building works within the RPA if at all possible but if not then carefully consider the following: where the RPA is likely to be severely affected because of site design constraints then felling and planting replacement(s) trees in a more suitable location on the site will need to be considered.
- 2. Where possible do not use strip foundations within the RPA, if absolutely necessary consider using a trenching saw or excavate by hand to avoid 'shatter damage' to the root system.
- 3. Consider using piling techniques for foundations @ maximum 350 mm diameter with ground beams on or above the surface of the root zone.
- 4. Unless unavoidable, do not exceed entering the root zone by more than one fifth of RPA radius.
- 5. Do not trench tangentially across the root zone for footings and services unless it cannot be avoided.
- 6. Consider 'no dig' techniques for services installation, with radial service lines being preferable to tangential across the root zone. Where this is undertaken then boring must be carried out below 600mm deep.

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7. Any hard surfacing, paths and roads need to have the same considerations for the RPA and as in the above points. Where possible paths and hard surfacing (patios etc) need to be surface constructed (cellular) and semi-porous to allow water penetration and gaseous exchange into the root system of trees.

Excavation within Root Protection Area of trees

Where trees are to be retained then any proposed foundation, underground services work and hard surfacing such as roads/paths falling within the RPA of trees that are to be retained shall be kept as far away from tree stems as possible(SEE NOTE 1 ABOVE). Where any such works are necessary within the RPA there will be a requirement to dig carefully by hand and ensure any roots encountered of maximum 25mm in diameter shall be exposed and correctly pruned back by a competent Arborist. Where larger roots are encountered of above 25mm in diameter then advice from the Arboricultural Supervisor (AS) for the site must be sought prior to any work being undertaken.

Any roots exposed/ pruned back as part of the above operation shall NOT be left exposed to drying out. All roots exposed/pruned shall be either covered with damp Hessian sacking prior to backfill or backfilled/covered immediately with a suitable open and free draining compost/loam.

Site Hoarding

Site hoarding shall be no closer than 1.5 metres away from the stem of retained trees and consist of 20mm plywood sheets supported by minimum 100mm square posts and 100 x 50mm rails with posts at 2.5 metre centres.

Post holes for site hoarding that are required within the RPA of nearby trees shall be dug by hand and are to be a maximum of 300 x 300mm and 450mm deep

Ground Protection System Specification:

- Level area of RPA concerned by blinding with sharp sand at maximum depth of 50mm
- Lay geo-textile membrane such as 'Terram' to cover area concerned
- Cover geo-textile with maximum of 100mm MOT Type 1 sub-base
- Retain MOT type 1 with edge restraint such as 30 x 100mm edging board pegged every 2 metres to prevent migration of the sub-base

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Addendum 2

Ref: Addendum 3

Schedule of Tree Works

Trees and vegetation recommended for removal:

Tree number	Species	Tree work
T2	Pittosporum	Fell to ground level
T3	Purple Plum	Fell to ground level

Recommended work for trees being retained:

Tree number	Species	Tree work
T11	Purple Plum	Crown clean. Thin crown by 15% and remove all epicormic and basal growth

Tree work to be carried out to the following standards and guidelines:

- 1. BS 3998:2010 Recommendations for Tree Work
- 2. Tree pruning cuts will be carried out using the 'Natural Target Pruning' technique as defined by: BS 3998:2010 section 7.2.5 and Fig. 2 The Pruning of Trees, Shrubs and Conifers: George E. Brown & Tony Kirkham 2nd edition revised & enlarged 2004 and Section 3.1.27 of The Arboricultural Association Specification for Tree Works June 2008.
- 3. Crown clean involves removal of dead, diseased & dying wood from tree crown, thinning of overcrowded crown, and removal of all epicormic growth within crown including stem & basal epicormic growth.

Tree Planting:

Replacement for trees removed is proposed as part of the new garden design and this will take the form of native tree planting with species such as Small Leaved Lime, Hornbeam and Field Maple planted as container grown advanced nursery stock at 16/18cm girth and 4.5 metre + height.

Planting method to be Method 1 as below

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Addendum 3 - Schedule of Tree Survey Information - BS5837:2012 section 4.4

SITE: 8 Lindfield Gardens, London NW3 6PX DATE: 14th January 2013

Tree	Species	Diameter	Height	Crown	Age	Grading	Estimated	Structure	Physiology, Condition &	Management
Number		mm	metres	Spread	Class	Category	Future		other factors	recommendation
				metres			Lifespan			
T1	Horse Chestnut	1000	22	N =5	М	B2	20-40	M	Average to declining	N
				S = 5					Crown has been reduced overall.	Al
				E = 5					Many small to medium cavities on	
				W =5					stem and main limbs. Large scar in crown from torn out branch.	
									Leaning to the south by 10 deg.	
									From vert.	
									Growing in first terrace level grass	
									area at approx. 2.5 metres above	
									rear door patio level	
T2	Pittosporum	120	4	N =	M	U	<10	M	Ornamental large shrub	F
				S =						
				E =						
				W =						
T3	Purple Plum	150, 170	12	N =4	M	C2	20-40	M	Average	F
		& 200		S = 4					Growing in bed close to retaining	
				E = 4					wall of first terrace level	
				W =4						
T4	Silver Birch	320	15	N =4	M	C2	20-40	G	Average	N
				S =4					Growing in first terrace level at	
				E = 4					similar height to T1	
				W =4						
T5	Sycamore	420	15	N =3	M	C2	>40	G	Above average	N
		S = 3						Growing in second terrace level		
				E = 3						
				W =3						
T6	Sycamore	600	18	N =3	M	C2	20-40	M	Average	N
				S = 3					Growing in second terrace level	
				E = 3					Large limb removed from top of crown	
				W =3					Clowii	

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Tree	Species	Diameter	Height	Crown	Age	Grading	Estimated	Structure	Physiology, Condition &	Management	
Number		mm	metres	Spread	Class	Category	Future		other factors	recommendation	
				metres			Lifespan				
T7	Horse Chestnut	350	18	N =	SM	B1	>40	G	Above average	N	
				S =					Growing in first terrace level close		
				E =					to shed and T1. Will make a good replacement for T1 in future		
				W =					·		
T8	Silver Birch	250	15	N =3	SM	C2	20-40	М	Average	Possible future fell	
				S = 3					Growing in second terrace level	due to condition and	
				E = 3					Leaning north and suppressed by T5	situation	
				W =3					-		
Т9	Oak	700#	22	N =9#	М	A1, A2	>40	G#	Above average	N	
	NDG			S = 9					Growing in NDG		
				E = 9							
	_			W =9							
T10	Pear	400	10	N =2	М	C2	20-40	М	Average Growing in second terrace level	N	
				S = 2					Heavily crown reduced in recent		
				E = 2					past		
T 4.4	5 1 5	250		W =2	M	B2	20-40	M	'		
T11	Purple Plum	350	8	N =4 S = 4	IVI	B2	20-40	IVI	Average Growing in raised bed at front and	CC TC-15%	
				S = 4 E = 4					very close to garage access track	RE	
				W =4					retaining wall	NE NE	
T12	False Acacia	400	15	N =3	М	C2	20-40	M	Average	N	
112	raise Acacia	e Acacia 400	13	S = 3	141	C2	20 40	101	Growing in raised bed very close to	IN .	
				E = 3					retaining wall of side access path		
				W =3							
T13	Bay	Bay	3x300	10	N =3	М	C2	20-40	M	Average	N
113		0.000		S = 3					Growing in raised bed at front of		
				E = 3					house		
				W =3							

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TREE SURVEY KEY:

Tree Number and Species = number of tree on plan and Common Name/botanical name

Height = estimated height of tree from surrounding ground level +/- 1.5 metres

Diameter = diameter of main stem @ 1.5 metres above ground level

Crown Spread = maximum extent of branches measured radially from the base of the tree, trees with asymmetrical crowns are shown with distances in relation to compass points. N = north etc.

Crown Height = height of canopy and/or first major branch above ground level

Age Class = Young(Y): age less than 1/3rd life expectancy | Semi-mature(SM): 1/3rd to 2/3rd life expectancy | Mature (M): Over 2/3rd life expectancy | Over mature (OM): mature and in state of decline | Veteran (V): Surviving beyond typical age range for species

Grading Category: As per BS 5837:2005 Table 1 – Tree quality assessment, which refers to tree quality and landscape/amenity value; A=high, B=moderate, C=low **Estimated Future Lifespan** = estimated useful and remaining contribution to the site in years - <10, 10-20, 20-40 & >40

Structure = structural condition of the tree based on roots, trunk, and major stems/branches along with the presence of any structural defects and decay organisms. Categories are: Very Good (VG); Good (G); Moderate (M); Poor (P); Hazardous (H)

Physiology/Condition = Overall health, condition and function of the tree in comparison to a 'normal' specimen of its species and age. Categories are: Above average (AA); Average (A); Declining (D)

Other factors = any other physical/environmental factors that could influence the tree now/in the future

Management Recommendations: N = no work required. CC = removal of dead, diseased & dying wood from tree crown, thinning of overcrowded crown, removal of lvy from crown & stem and removal of all epicormic growth within crown including stem & basal epicormic growth on Lime trees.LC = lift crown. TC = thin crown. RC = reduce crown. P = pollard. SP = scaffold pollard. RE = remove epicormic and basal growth. FP = Formative prune F = fell to ground level. FG = fell and grind out stump. R = carry out replacement planting. Al = 3 yearly arboricultural inspection

N/K = not known

= estimated data

NDG = Next door garden

Alan Mitchell System = Estimate of tree age based on open grown tree with full crown. Age in years = Girth (circumference) in centimeters measured at 1.5 metres above ground level and divided by 2.5 ie. Tree of girth 250 cm = 100years old

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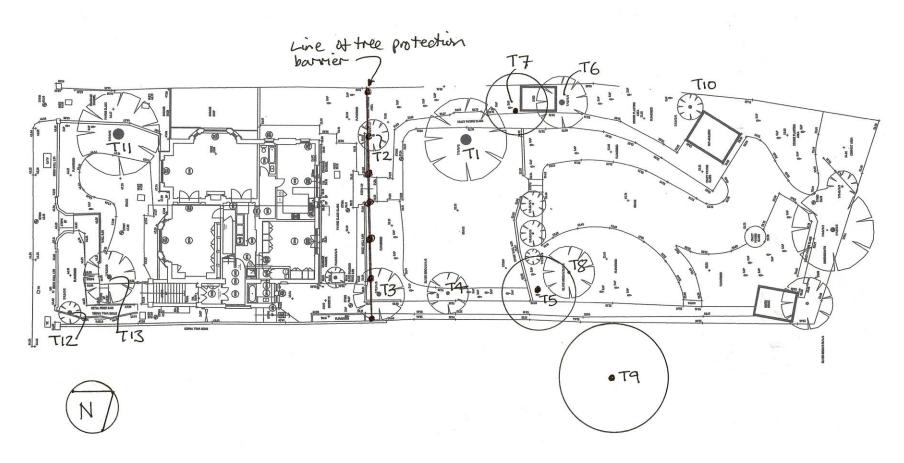
Tel: 07860 445380

PLAN OF SITE & TREES

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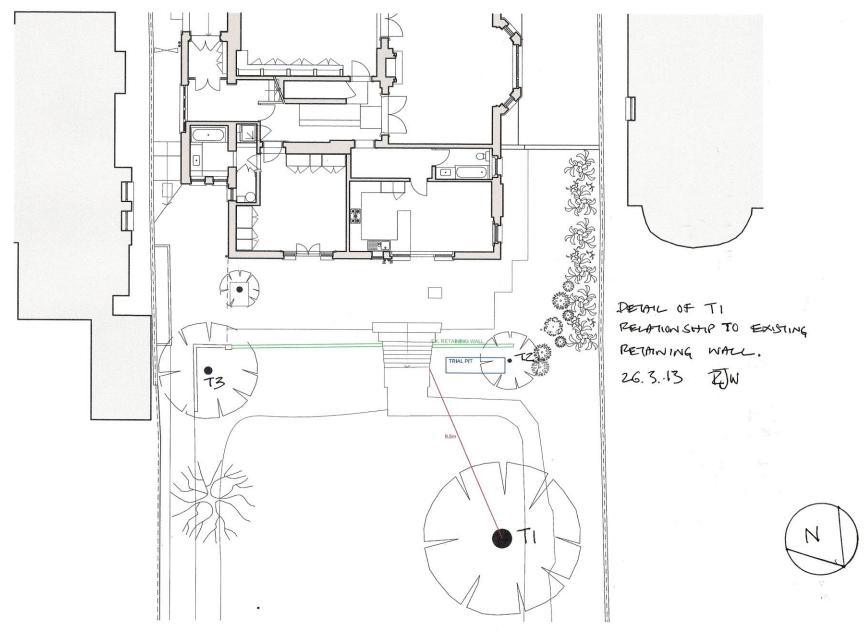
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TREE SURVEY PLAN OVERLAY DW 18.2.13 8 LINDFIELD GARDENS, NW3 GPX 1ZEF: Addendum 3 of report



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PICTURE GALLERY

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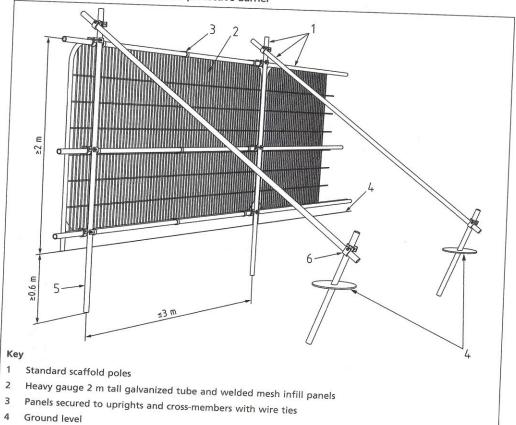
TREE BARRIER SPECIFICATIONS TREE PLANTING SPECIFICATIONS TREE CARE FLOW CHART

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6.2.2.4 All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE - NO ACCESS".

Default specification for protective barrier



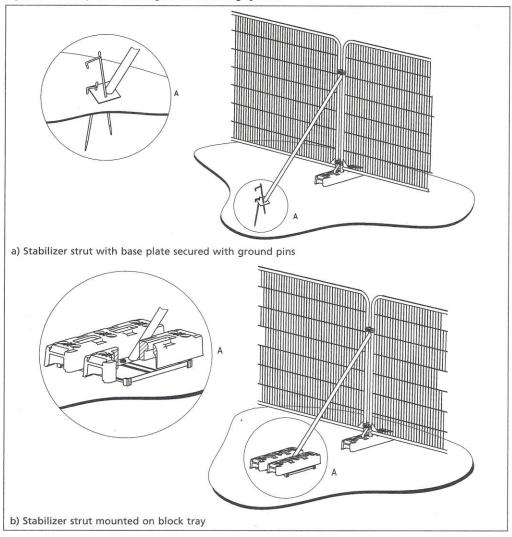
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Standard scaffold clamps

Uprights driven into the ground until secure (minimum depth 0.6 m)

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New Tree Planting Specification

All new trees planting whether as replacement planting for trees removed as part of the development or as additional trees within a landscape scheme for the development shall be of a size from standard trees up to advanced nursery stock.

The trees supplied will be either container grown or root-balled and preferably supplied and planted in the dormant season from October to March

Tree Sizes:

Standard = 8-10cm girth and 2.5-3.0 metres high

Heavy Standard = 12-14cm girth and 3.5-4.25 metres high

Advanced nursery stock = 16-18cm/18-20cm girth and 4.5-6.25 metres high

Girth is measured at 1 metre above ground and all trees will generally have a 1.5-1.8 metre clear stem

Method 1

- 1. Create planting pit by excavating to required depth and diameter to provide sufficient space to accommodate the root ball of the tree with 100-150mm space around the root ball to enable back fill to be placed and firmed. Ensure tree is located within the planting pit at the nursery level with the surrounding ground level.
- Back fill for the planting will be as dug for the tree pit and incorporated with 80 to 160 litres of Tree
 Planting & Mulching Compost prior to back filling. Where soil is of very poor quality this will be
 replaced with imported soil/growing medium to BS recommendations
- 3. Root balled trees to be placed in tree pit with hessian and wire wrap retained and container trees to be placed in pit prior to removal of container before back filling.
- 4. Root pruning of damaged and girdling roots should be carried out at this stage prior to back filling
- 5. Back filling is to take place in stages by firming layers of soil around the root ball to the finish surface level.
- 6. Support for the tree will be by using the short twin stake method. This requires use of 1.8 metre long and 100mm diameter machine rounded pressure treated stakes driven into the ground either side of root ball to a minimum of 600mm and at 180 degrees apart. Distance between stakes will vary depending on root ball size but should be no greater than 600mm
- 7. Trees shall be tied to the stakes using flexible tree banding positioned 100mm below top of the stakes. Each tie will be felt nailed to stake and taken around the tree with 3 twists on its self before nailing back on the stake. Tree ties should be tensioned accordingly to enable good support but flexibility for the tree.

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- 8. The tree planting to be completed with a 75mm layer of good quality composted bark mulch to 500mm radius around tree, which will assist with moisture retention and weed suppression during the establishment phase
- 9. Irrigation for the tree is to be supplied by the 'Treegator' system which shall be supplied at time of planting and positioned around the stem as required.
- 10. Aftercare for trees will consist of filling 'Treegator' once per week in growing season for the first year of establishment and up to 2 years after planting as required. Checking tree stakes and ties on an annual basis for up to 2 years after planting. Formative pruning of the crown as required within the aftercare period. Weed control of tree base area as necessary.

Method 2

- 1. As per method 1 above with the exception of points 6 and 7
- 2. Support for the tree will be by use of the 'Platypus' or similar tree root anchor system installed as per manufacturers recommendations
- 3. This system will be used for mainly advanced nursery stock plants and above

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The design and construction process and tree care Planning and design (based on architects' work stages) BS 5837:2012 recommendations and references Site operations Topographical survey and soil assessment (4.2 and 4.3) Vegetation clearance, if required for survey A Feasibility Tree survey (4.4) Feasibility and planning Tree categorization (4.5) Identify tree constraints and RPAs (4.5, 4.6 and Clause 5) Design brief Identify and review potential trees for retention and removal (Clause 5) C Conceptual design Produce new planting and landscape proposals (5.6) Produce tree protection plan (5.5) development* SCHEME DESIGN APPROVALS
(from client and regulatory bodies) Resolve tree protection proposals (6.2) Detailed/technical design Technical design' Agree new utility apparatus locations, routes and arboricultural methodologies (6.1 and Clause 7) Production Schedule trees for removal and pre-construction tree works (including access facilitation) (5.4 and 8.8) information G Tender Identify tree protection measures and include them on all relevant documents (6.2) documentation Physical barriers H Tender Implementation and aftercare action Site clearance and demolition (Clause 7) Access, storage and working areas installed (Clause 6) Mobilization Site monitoring and intervention as required (6.3) Construction Construction (Clause 7) to practical completion

Inspection of trees and surrounding environment

(including relationships to new structures) (8.8)

Recommendation for post-completion management (8.8)

* 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.

New planting

(Clause 8)

Remedial tree works if required

Figure 1

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Post-practical completion

** See Commentary on Clause 6.

Office: 15 Norcombe House, Wedmore St., Islington N19 4RD

Tel: 07860 445380