Landmark Trees

ARBORICULTURAL METHOD STATEMENT

29 New End

Hampstead

London NW3 1JD

REPORT PREPARED FOR:

The Linton Group

14 Basil Street

Knightsbridge

London SW3 1AJ

REPORT PREPARED BY:

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MSc ARB MICFor FArbor A MRICS C Env

Ref: LTN/29NE/AMS/01

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1.0 Introduction

1.1 Purpose & Use of the Method Statement

1.1.1 This outline method statement has been prepared for The Linton Group, for assistance with the discharge of planning conditions at 29 New End, Hampstead, London NW3 1JD: London Borough of Camden Planning Ref: 2012/3089/P and Appeal Decisions APP/X5210/A/14/2218243 and APP/X5210/E/14/2218267. The document will address the following conditions:

10) All trees on the site, or parts of trees growing from adjoining sites, unless shown on the permitted drawings as being removed, shall be retained and protected from damage. The trees shall be protected throughout the course of construction in accordance with the recommendations of the Tree Projects Arboricultural Report dated March 2012 and shall follow guidelines and standards set out in BS5837:2012 "Trees in Relation to Construction". No tree shown to be retained shall be pruned, lopped or otherwise altered except in accordance with details that have first been submitted to and approved in writing by the local planning authority.

11) Prior to the commencement of any works on site evidence in the form of photographs and an arboricultural report, demonstrating that tree protection measures have been implemented in accordance with the approved details, shall be submitted to and approved in writing by the local planning authority.

1.1.2 This document lays down the methodology for any proposed works that may have an effect upon the trees on and adjacent to the site. It is essential within the scope of any contracts related to the development proposals that this method statement is observed and adhered to. It is recommended that this document form part of the work schedule and specification issued to the building contractors and can be used to form part of the contract.

1.1.3 Copies of this document will be available for inspection on site. The developer will inform the local planning authority within twenty-four hours if the arboricultural consultant is replaced.

1.2 Terms of Reference

1.2.1 We (LT) are instructed by The Linton Group to prepare a method statement for proposed development based on the above planning application with reference to BS 5837:2012 Trees in Relation to Design, Demolition and Construction.

1.2.2 For this purpose, The Linton Group has supplied a Construction Management Plan (CMP) dated October 2015. Through our involvement with the site through the appeal process with Karawana Holdings Ltd, a site lay-out plan (JKK4657_1A-TOPO), the current proposals plan (NEN - PL - 120 rev L) and a draft services plan (*TO BE SUPPLIED*). Engineers, Taylor Whalley Spyra have

supplied copies of the piling plans (8082/CM03-A & 8082/CM03-B). We are also reliant upon our own impact assessment report KWA/29NE/AIA/01a and plan overlays of tree constraints contained therein.

1.3 Development Proposals & Potential Impacts

1.3.1 The principal proposals are for the demolition of the existing building and replacement with residential flats with a basement and associated landscaping.

1.3.2 The principal primary impacts of the proposals are the felling of 5 category 'C' trees T3, T5, T10, T11 and T14 (with 4 further category 'U' trees T2, T8, T9 and T12 to be felled on husbandry grounds/ to facilitate landscaping).

1.3.3 Other primary impacts include the minor Lower Ground Floor (LGF) Level encroachment of T1 and T4's theoretical RPA. Both impacts to T1 and T4 (also subject to a TPO) have been investigated by trial pits and are (very) low. The construction of the LGF beneath the canopies of both trees has been investigated in detail for the appeal process. T1 already requires arboricultural work to be undertaken on husbandry grounds (see Appendix 2), which will provide the necessary clearance for construction. A crown-lift to T4 would also provide the necessary clearance, provided low-access equipment is used (e.g. mini-piling rigs).

1.3.4 The demolition of the existing property will be undertaken with due care, proceeding inwards in a "top-down" fashion. Adequate supervision and protection of the retained trees will be provided in accordance with this AMS.

1.3.5 The removal of the existing tennis court and proposed landscaping to the rear of the property also has the potential to cause significant impacts. However, with the manual excavation of the tennis court and no-dig/porous paving replacement treatment, the impact to the retained trees would be minimal, if not beneficial. Services will also proceed through these protected areas under supervision, adopting the NJUG provisions for hand-digging and trenchless techniques.

1.4 Sequence of Works

1.4.1 The sequence of works will be as follows:

- initial tree works – felling, stump grinding and pruning for working clearances
- installation of Tree Protection Barrier (TPB) & ground protection (photographic evidence required by Condition 11)
- demolition of existing building & landscaping
- installation of supplementary ground protection
- installation of underground services
- main construction
- removal of TPB

- soft landscaping

1.4.2 A summary of the key dates from the CMP (October 2015) is provided in Extract 1:

Activity	Commencement	Duration
Planning conditions discharged	November 2015	16 Weeks
Demolition agreements in place with Adjacent Party walls	November 2015	
Commence Enabling works (Demolition)	January 2016	
Demolition activities	January 2016	16 Weeks
Piling and Excavation works	May 2016	25 Weeks
Superstructure Frame	October 2016	23 Weeks
Envelope and roofing works	May 2017	30 Weeks
Internal Fit out works	July 2017	42 Weeks
Completion	June 2018	

Extract 1: Summary of key dates (Source: CMP October 2015)

1.4.3 These works and their arboricultural implications are outlined in sequence below.

1.5 Site Supervision

1.5.1 An individual e.g. the Site Agent, must be nominated to be responsible for all arboricultural matters on site. An agent must be nominated for each phase of work, if demolition and construction contracts are to be awarded separately. The agent(s) must:

- be present on site for the majority of the time
- be aware of the arboricultural responsibilities - to this end, a site briefing / meeting between the agent and arboricultural consultant must be held before the commencement of each phase of works.
- have the authority to stop any work that is causing, or has the potential to cause harm to any tree
- be responsible for ensuring that all site operatives are aware of their responsibilities toward trees on site and the consequences of the failure to observe these responsibilities.
- Make immediate contact with the local authority and/or a retained arboriculturalist in the event of any tree related problems occurring, whether actual or potential
- At this stage, the nominated Key Personnel are as follows:

Adam Hollis Tel: 0207 851 4544
Arboricultural Consultant
Landmark Trees
info@landmarktrees.co.uk

Nick Bell Tel: 020 7974 5939
Arboricultural Officer
London Borough of Camden
nick.bell@camden.gov.uk

Gordon Jefferys Tel: 020 7692 5000
Architect
KSR Architects
Gordon.jefferys@ksrarchitects.com

Niki O'Hara Tel: 020 3402 5101
Projects Director
The Linton Group
glinton@thelintongroup.co.uk

1.6 Site Monitoring

1.6.1 Landmark Trees are to be retained as Arboricultural Consultants responsible for site monitoring for the duration of the development. As noted above Adam Hollis MSc (Arb) is the key contact, with monitoring occasionally undertaken by James Bell Tech Cert. (subject to any new staff intake). Site monitoring will be undertaken by a qualified and experienced arboriculturalist at pre-determined and agreed time intervals as indicated in Table 1 below.

1.6.2 The arboriculturalist will arrive at the site, check in at the site office and be safely escorted around the site by the site agent, checking the maintenance of tree protection measures. Routine visits will generally be unannounced. However, the arboriculturalist will also visit subject to advance notification and agreement to supervise any agreed works within the RPA.

Table 1: Site Monitoring Visits

Supervision Visit No:	Details	Action
Visit 1: Pre-Development Site Inspection (S.2.3 of AMS)	• To included construction Site Agent briefing (S.1.5). • To confirm position of protective fencing and that it has been erected in accordance with AMS; take photographic evidence (Condition 11, S.2.2 and Tree Protection Plan in Appendix 5); • To check any pre-demolition/construction ground protection is in place. • To check any tree works have been undertaken in accordance with this AMS (S.2.1. and Appendix 1). • Determine if further tree work is required and seek required permission if necessary. • To check site facilities/access are in accordance with the AMS (S.3.3).	Issue a brief report with photographs to Architect, Tree Officer and Main Contractor within 5 days of site supervision visit (see Appendix 3).
Visit 2: Demolition of hard surfaces/structures.	• Confirm position of any additional temporary ground protection and that temporary ground protection is in accordance with AMS. • 2 weeks prior notice required.	Issue a brief report with findings to Architect, Tree Officer and Main Contractor within 5 days of site supervision visit
Ongoing Monitoring Visits	• Periodically during 12 months (or longer) of entire project. • Visits will be based intensity of site operations; once a month is considered reasonable. • Attend site to confirm protective measures are still in place. Ensure attendance is timed for any other key elements of proposed (and any other unplanned) incursions into the protection areas.	Issue a brief report with findings to Architect, Tree Officer and Main Contractor within 5 days of site supervision visit.
Final Site Visit - Completion of construction phase supervision visit (S.5)	After it has been confirmed that the construction phase is complete, allow removal of temporary ground protection and protective fencing. Specify any remedial work if necessary.	Issue a brief report with findings to Architect, Tree Officer and Main Contractor within 5 days of site supervision visit.

1.6.3 The LPA's Arboricultural Officer will have free access to the site (subject to health and safety measures) and report on any problem areas directly to the developer's Project Arboriculturalist, who will then visit the site and make recommendations to the developer on how best to rectify the situation and ensure implementation. A final sign-off visit will be carried out at the end of the development and a formal letter sent to both the client and LPA indicating an end to the monitoring period. It is the client's duty to notify LT that the project has been completed, in order to facilitate such an inspection.

1.6.7 N.B. Landmark Trees will only be responsible for providing monitoring in so far as they fully instructed to do so and regularly paid for such services by the client. In the absence of routine payment (as per our business terms), routine monitoring will cease (temporarily or permanently)

and the LPA will be informed of the cessation of monitoring. The client will also reserve the right to dismiss Landmark Trees and replace with another arborist, but must inform the LPA.

1.7 Statement Adoption

1.7.1 It is recommended that, in due course, acceptance of the recommendations in this report is demonstrated by, for example, the architect specifying in writing to the building contractor that tree care conditions apply in execution of the contract, and by an estimate or written undertaking from the contractor to the architect demonstrating that the practical aspects of tree protection recommendations have been priced in to the job. If conflicts between any part of a tree and the building arise in the course of development these can often be resolved quickly and at little cost if a qualified arboriculturist is consulted promptly. Lack of such care is often apparent quickly and decline and death of such trees can spoil design aims and can of course affect saleability, and reflects lack of best practice. Trees that have been the recipients of careful handling during construction add considerably to the appeal and value of the finished development.

2.0 Pre- Development Site Preparation

2.1 Arboricultural Works

2.1.1 All works must be carried out by a competent arborist in accordance with BS 3998: 2010 and any other prevailing good professional practice including BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations.

2.1.2 Specific works recommended to facilitate development are the removal of trees T3, T5, T10, T11 and T14 (with 4 further category 'U' trees T2, T8, T9 and T12 to be felled on husbandry grounds/ to facilitate landscaping). Pruning works include the crown lifting/reduction of T1 on both husbandry grounds and to facilitate development. These specific works to facilitate development and any other husbandry works are listed in Appendix 1.

2.2 Installation of Tree Protection Barrier

2.2.1 BS5837: (2012) Trees in Relation to Development stipulates the following:
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.

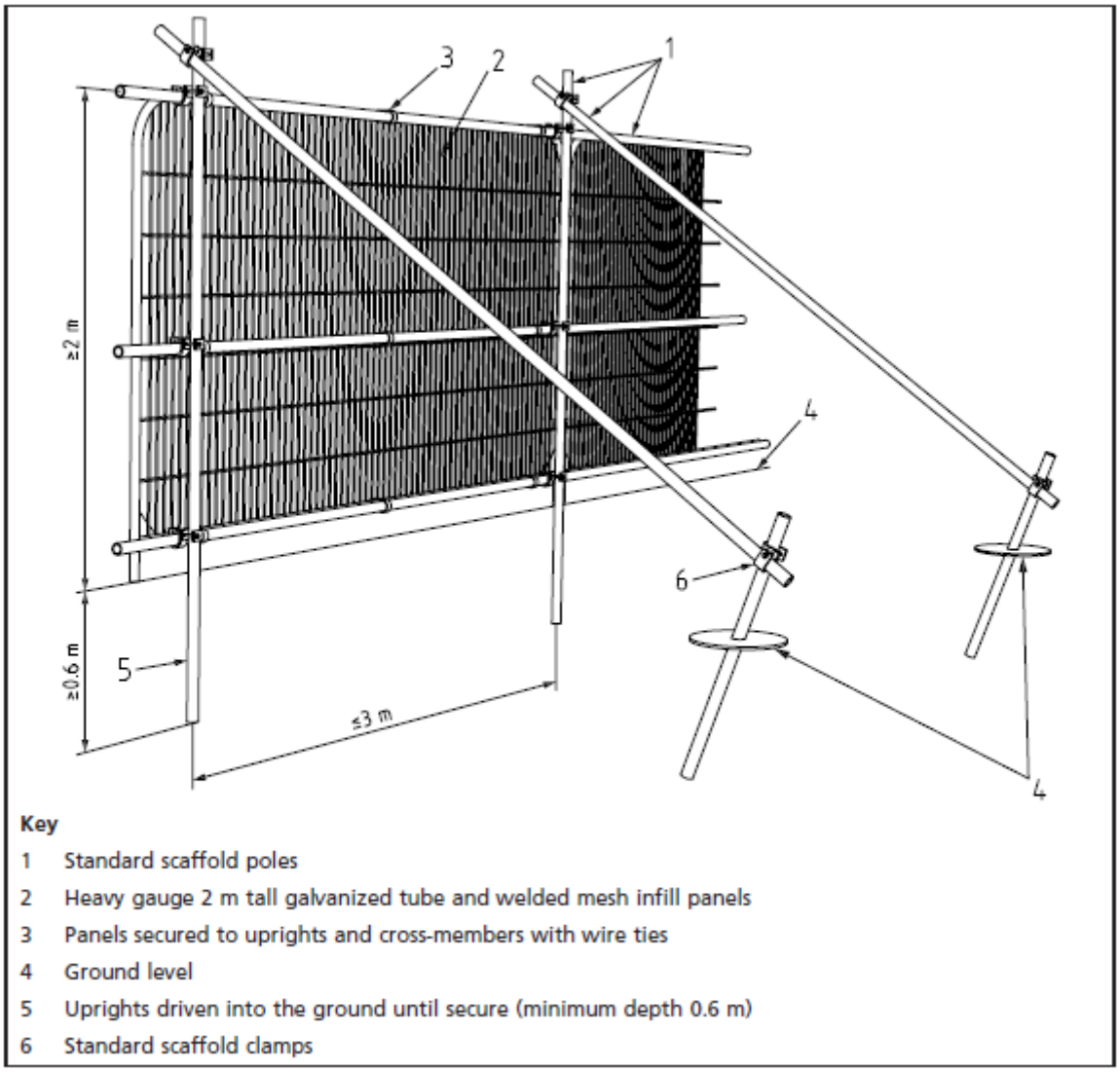
2.2.2 Solid ply hoarding, 2.4m in height, will be erected to the perimeter of the site (where possible). For internal site trees, a Tree Protection Barrier [TPB] comprising steel mesh panels of 2.4m in height ('Heras') should be erected to protect trees near buildings to be demolished on site. These panels will be mounted on a scaffolding frame as shown in Figure 1 below (this is also Figure 2 of BS5837: Trees in Relation to Design, Demolition and Construction in paragraph 6.2.2.2).

2.2.3 This TPB is to be erected before any work commences on site, is to remain *'in situ'* undamaged for the duration of all work or each phase, and only to be removed once all work is completed. If any work is deemed necessary prior to the erection of fencing a Landmark Trees representative should be informed to enable their presence to oversee the work being carried out.

2.2.4 The only other exception is the completion of soft landscaping but if any excavations, however minor, are to be carried out as part of soft landscaping within RPAs, an arboricultural assessment must be carried out beforehand and any arboricultural protection measures incorporated. The TPB should carry waterproof warning notices denying access within the RPA.

2.2.5 The Tree Protection Plan in Appendix 5 illustrates where the protective fencing will be located to form the boundary of the Construction Exclusion Zone (CEZ). The CEZ is an exclusion zone and suitable steps will be taken to prevent access by pedestrians and vehicles and the storage of any works materials and equipment will be located outside of the CEZ. Where areas of the RPA lie

outside the CEZ, ground protection measures will be required, which includes areas of the RPA of T6 where the site facilities are to be located.



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

Fig. 1 Tree Protection Barrier Specification
(Source: Figure 2 from BS5837 - Default specification for protective barrier)

2.3 Pre-Development Site Inspection

2.3.1 Upon completion of the tree works and installation of the protection measures, the standard of work can be checked by the retained arboricultural consultant who can then liaise with the local authority. If there are any amendments to either the tree works or additional protection measures, they will be agreed at this meeting and confirmed in writing.

3.0 Development Phase

3.1 The following general precautions will apply:

- No fires shall be made on any part of the site, or within 20m of any tree to be retained.
- No spilling or pouring of fuels, oils, solvents, tar shall be made on any part of the site. Due to the use of forklifts and other mechanical plant, diesel will be required to be stored on site. For this purpose double skin tanks with integral bund will be utilized.
- No materials that are likely to have an adverse effect on tree health such as oil, bitumen or cement will be stored or discharged within 10 metres of the trunk of a tree that is to be retained.
- No spillage or discharge of wet mortar or concrete shall be made on any part of the site.
- No storage of materials shall be made within the protective fences.
- No breaching or moving of the protective fences without the approval of an arboriculturist.
- Alterations in levels within the tree protection fence areas shall be avoided.

3.2 Root Protection Areas (RPA)

3.2.1 The Root Protection Area (RPA) is a desirable zone of protection around the trees' rooting system and these have been marked on the plan in Appendix 5. As much as possible, the RPA's will lie within the CEZ and therefore, be fully fenced off. However, this degree of protection is not entirely possible on the site: it is necessary to perform some works (in part) within the RPA.

3.2.2 All involved parties will need to be made aware of the deficiencies. In these instances, careful and supervised working, as described in sections, S. 3.4 (routing of services) and S. 3.6 (demolition of surfaces) and S. 3.7 (construction) will be required.

3.2.3 Ground outside the CEZ must be protected from site traffic and not left exposed during construction. As far as practical, existing hard surfaces should be retained as initial ground protection (where fit for purpose for anticipated loading) until the landscaping phase and / or substituted / supplemented with appropriate materials (e.g. Infraweb, Ground Guards etc.), capable of withstanding anticipated loads. **NB the provision of ground protection on plan does not prohibit the consented laying of services and related works in those areas. It means that those operations should proceed under caution and protect adjacent ground to that immediately requisitioned for the work in hand.**

3.3 Site Access, Accommodation & Storage

3.3.1 It is envisaged that vehicles will need to be loaded and unloaded from outside the site boundary, with most of the deliveries being undertaken from the New End elevation of the site. Detailed discussions will be held with the London Borough of Camden team to agree the loading area on New End with the suspension of the parking bays directly out side of the site boundary. The existing

site access will be used for turning vehicles only. All traffic movements will be controlled by a Banksman and Traffic Marshall.

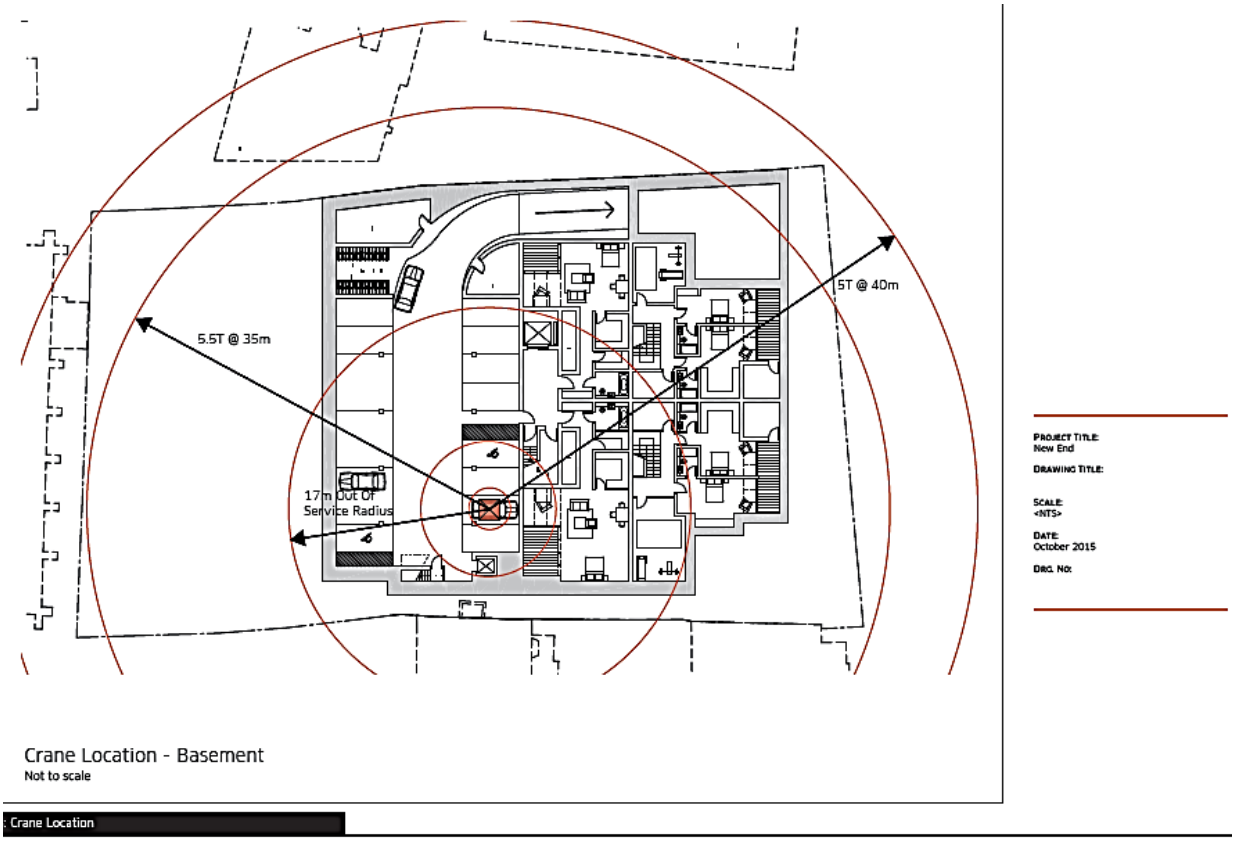
3.3.2 Pedestrian access will be via a dedicated entrance from the foot path that runs to the east of the site boundary, separate to the main loading and unloading area with the aim to separate pedestrian and vehicle movements at all times to reduce the risk of accidental collisions.

3.3.3 The site set up will develop in several phases, with a mixture of on and off site provision, changing as the scheme progresses. It will be necessary to have a site accommodation to the rear of the site for the demolition, substructures and concrete frame works phases. This will comprise double-stacked cabins containing the site toilets, changing and drying facilities and a canteen unit. The cabins will be located as per the layout within our Tree Protection Plan (Appendix 5), requiring minor additional tree works to crown lift T6 to 5m and ground protection for the RPA (retention of existing hard surfaces/infra web). As the frame is erected it will be possible to relocate the site accommodation into the basement of the building.

3.3.4 Bulk/large materials will be delivered to site, and off loaded by the tower crane to designated loading areas via loading bays. As works develop, materials will be distributed via the goods hoist to the required level and positioned directly adjacent to the intended work place. Where possible lockable storage areas will be established on site and will be utilized for the storage of small items of material, small plant and will have facilities for storage and testing of materials.

3.3.5 Access for the substructure works will be from a managed point on New End, giving access directly onto the site. Delivery lorries will be excluded from RPA's by tree protection fencing and ground protection. Adequate allowance must be made for vehicle heights and ground clearance, where tree canopies overhang access routes. Any further pruning for working clearances must be discussed first with the arboriculturalist; once agreed in principle these works should be approved by the appropriate tree officer and approved in writing by the LPA. Materials can be unloaded onto protected ground within RPA's and stored throughout the interior of the site(s) away from protected trees.

3.3.6 Many site activities are potentially damaging to trees e.g. material storage, parking, soil compaction and the use of plant machinery. In this latter example particular care is required to ensure that the operational arcs of excavation and lifting machinery, including their loads, do not physically damage trees (i.e. T1 and T4) in use. The following extract illustrates the location of the crane



3.4 Routing & Installation of Services

3.4.1 Every effort should be made to ensure that the routing and instillation of services avoid the RPA at the design stage; however if unavoidable then it may be possible, with written permission from the LPA, to implement the provisions of BS5837 and NJUG VOLUME 4 (e.g. radial trenching and /or mole trenching) under arboricultural supervision.

3.5 Changes in Grade

3.5.1 The upper layer of top soil contains the majority of a tree's roots and if this is disturbed by a reduction in ground level, serious damage can be caused. If ground levels need to be marginally altered within the RPA of any tree for the proposed landscaping, prior agreement must be sought from the Tree Preservation Officer and given in writing by the LPA.

3.6 Demolition Measures.

3.6.1 The building will be demolished in a sequential fashion top down and from the back of the site to the front. Arisings will be removed from site using appropriate vehicles that will be located in the designated removal zone on New End.

3.6.2 Access facilitation pruning will be undertaken to prevent injurious contact between demolition plant and the tree(s). Any such pruning will be undertaken in accordance with British Standard

3998: Recommendations for tree works (See Section 2.1 / Appendix 1) and in agreement with the local authority.

3.6.3 At the outset of the project a dust and air quality management plan will be produced. This plan will consider the use of water suppression, dealing with demolition arising's, encapsulation of areas, scaffolding and general site waste management. The CMP confirms that water will be used to suppress the dust generally and specifically where demolition, cutting and breaking of concrete is being carried out. All skips and wagons containing waste will be securely covered and water 'misted' as appropriate. Dust monitoring will be carried out at regular intervals, increasing in frequency during works that will inherently generate dust (e.g. demolition and reinforced concrete works). If the levels of dust particles in the air are deemed unacceptable action will be taken, and measures to avoid, reduce and/or suppress any dust will be evaluated and implemented. At the boundary to the site specific risk assessments will be carried out in relation to dust emissions and where practical dust screening measures will be placed at the boundary.

3.6.4 Trained and responsible management will be maintained on site at all times during working hours. Where levels of dust build-up on trees occur, it may be necessary to seek the advice of Landmark Trees on remedial measures, e.g. hose down the tree(s) immediately following any significant accumulation of dust.

3.6.5 All spoil is to be loaded into trucks reversing into site from the road or removed to trucks on the road outside.

3.6.6 Any existing hard standing within the RPA's will be first broken up with manual power tools and then carefully removed manually. Soil exposed beneath the structure will not be scraped away, but preserved in situ and protected immediately (not tracked over) with replacement ground protection (as per para 3.2.1) before the continuance of operations.

3.7 Construction Measures

Detailed method statements and risk assessments will be obtained from all specialist subcontractors involved in the new build and these will be scrutinised by the site agent to ensure the AMS requirements have been considered therein.

3.7.1 The New Construction works will commence as the demolition activities complete. A suitable graded ramp will be left by the demolition contractor to mobilise the piling rig that will pile the secant and contiguous wall. Once the piling has been installed the bulk excavation can take place. Temporary works will be required to the secant wall and the site perimeter walls to ensure their stability during the excavation and until the permanent condition is achieved.

3.7.2 The tower crane will be installed early in the programme providing a vertical transport route from the New End to the footprint of the site. The Crane selected is a Luffing Jib crane and has been chosen for the following reasons:

• Luffing Jib cranes can be zoned for lifting meaning that construction loads are only lifted over the footprint of the site. The crane coordinator will ensure that stringent controls are put in place and implemented for all lifting activities on site.

• Can lift large capacities from the perimeter of the site and can remove the site cabins once the building has been constructed (Note: consideration must be given to the logistics of positioning/moving cabins from beneath the canopy of T6 prior – it would be preferable to avoid locating cabins beneath T6).

• Having the location mid distance into the site means that the crane can be more efficient both in capacity/over sail and cost. It will also reduce the potential for damage to the canopies of trees retained around the boundaries of the site.

3.7.3 Any scaffold erected to the external elevations will be fully wrapped in monarflex or debris netting to contain the construction activities. Where erected within an RPA, the following ground protection will be required:

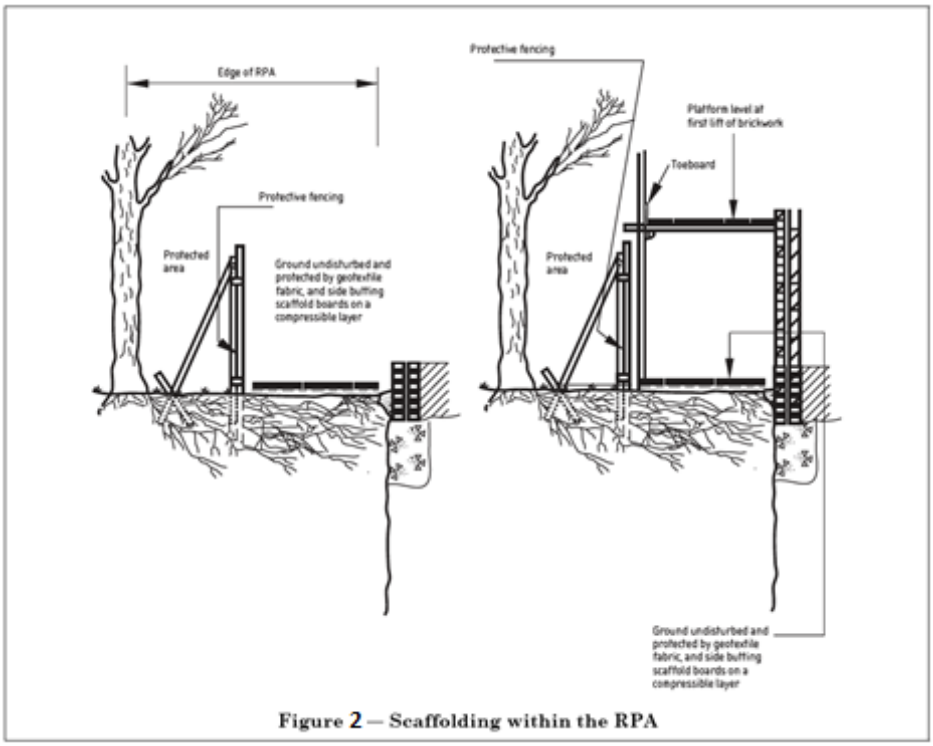


Figure 2 — Scaffolding within the RPA

3.7.4 The replacement paving/hard landscaping within RPA will require a no-dig construction technique, either using a cellular confinement system with no fines aggregate for the sub-base or simply building upon the existing sub-base without disturbing the ground below. Choice of construction method will initially depend upon root penetration within the existing sub-grade. The key principle is not to excavate in the presence of roots and to provide a porous surface to promote healthy soil water relations for future root growth. A further consideration in the use of a more expensive cellular confinement system or similar, may be the claimed reduction in risk of possible future slab / surface displacement by roots of trees growing in paved areas.

3.7.5 New hard landscaped areas within RPA will require the use of no-dig construction techniques. A sample specification for no dig landscape construction by trees T4 – T7 is as follows:

i. The Construction should ideally be undertaken between May and October when the ground is sufficiently dry to prevent compaction occurring. Any surface vegetation should be removed by hand or with suitable herbicide.

ii. Fill any hollows in the exposed ground with sharp sand or 4/20mm or 40/20mm clean angular stone.

iii. Place Permatex 300 Geotextile over the area to be protected ensuring laps are a minimum of 300mm. The geotextile should not be trafficked across at any time.

iv. The Infraweb system is available in 5 depths for varying traffic loadings but each site should have a specific design detailed to ensure the correct depth of product is used. However, unless the existing ground conditions are very soft and have a low CBR then the following can apply:

- 50mm deep InfraWeb for Pedestrians and Cycleways, non-vehicular traffic;
- 75mm deep InfraWeb for Pedestrians, Cycleways and vehicles up to 1.5 tons;
- 100mm deep InfraWeb for Cars, 4 Wheel Drives, Vans etc up to 6 tons;
- 150mm deep InfraWeb for Fire Tenders, Removal Vehicles and Dust Carts up to 20 to 20 tons;
- 200mm deep InfraWeb for construction vehicles, cranes etc 40 tons and above.

v. The system components are as follows:

- InfraWeb 3 Dimensional Cellular Confinement System
- Permatex 300 Separation Geotextile
- Permatex 200 Separation Geotextile (depending on surface finish)
- InfraWeb Staking Pins
- InfraWeb Stapler and Staples
- 4/20mm or 40/20mm Clean angular stone to Bs EN 13242 and 12620.

vi. Place the collapsed panel on the geotextile and pin through 3 cells across the 2.42m orientation using InfraWeb staking pins. Expand the panel to its full length of 8.7m and pin across the opposite panel end using InfraWeb staking pins. Pin along the length of the panel with 2 pins on each side using InfraWeb staking pins. If full panels are not being used then ensure the cells have been expanded to their full dimension. Staple any adjacent panels together using the Infraweb stapler and staples. The InfraWeb panels can be cut to shape if required with a heavy duty Stanley Knife.

vii. The correct specification of the granular infill is vital to the long term performance of the system. Use only 4/20mm or 40/20mm clean angular stone to Bs EN 13242 and 12620 (depending on cell depth being used). Fill the pockets of the InfraWeb with a 4/20mm or 40/20mm clean angular stone. Allow for any settlement of the stone in the cells and top up if necessary. **If the system requires trafficking immediately after installation for construction purposes then a 50mm sacrificial surcharge of the 4/20mm or 40/20mm granular material shall be placed on top of the InfraWeb.**

viii. The Infraweb TRP system can be surfaced with the materials listed below. Porous systems will be of greater benefit for the trees:

Block Paving:

- Place Permatex 200 separation fabric over the filled InfraWeb.
- Lay sand / gravel bedding material as per manufacturer's recommendations.
- Place porous / standard blocks as per manufacturer's instructions.

Porous and Standard Asphalt:

- Slightly surcharge the InfraWeb with 25mm of 4/20mm or 40/20mm clean angular stone.
- Place hot Asphalt as per manufacturer's instructions.

Resin Bound Gravels:

- Place Permatex 200 separation fabric over the filled InfraWeb.
- Lay Asphalt carpet and resin bound gravel to the required thickness and as per manufacturer's instructions.

Loose Gravels:

- Option 1 is to slightly overfill the InfraWeb with the clean angular stone.
- Option 2 is to place a 25mm thick decorative stone above the filled InfraWeb.

Slimblock Gravel Retention System

- Place Permatex 200 separation geotextile over the filled InfraWeb.
- Place 20mm bedding layer of 5mm single sized stone and lightly tamp.
- Lay Slimblock units and fill with a 10 to 14mm decorative gravel.

Slimblock Grass Protection System.

- Place Permatex 200 separation geotextile over the filled InfraWeb.
- Place 50mm of Rootzone (60% sand/40% soil) bedding layer and lightly tamp.
- Lay Slimblock units and fill with Rootzone mix and seed accordingly. (Please allow for 4 to 6 weeks for seed germination)

Tree Mulch

- Place Permatex 200 separation geotextile over the filled InfraWeb.
- Lay mulch to desired depth.

3.7.6 See cross-sectional diagram (Figure 5) below for further explanation. For technical data on the Geotextile membrane and the Infraweb cellular confinement system always refer to the manufactures guidelines for design and implementation. Further technical advice can be gained from the manufacturer:

Infra Green Limited
Warrington Business Park
Long Lane
Warrington
WA2 8TX
Tel. 01455 617139
www.infragreen-solutions.com

Case Study – InfraWeb TRP & Gravel Pro35

Project:
Monkton Combe Prep School

Client:
Monkton Combe Prep School

Designer:
Buro Happold

Main Contractor:
Verde Recreo

Products:
- InfraWeb TRP 2770m2
- Gravel Pro 35 1375m2

Monkton Combe School is an independent co-educational school based just a mile from the world heritage city of Bath. The continued development of the school's facilities has meant an increase in vehicular traffic to and from the site.

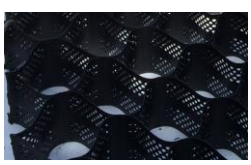
A new access road and verge parking areas were planned to accommodate the increased traffic, however, space on site is at a premium and locating these areas was a challenge for the client and design team.

The only route available for the new road would encroach on the root protection areas of exiting trees that were subject to tree preservation orders. This presented the designers with problems with creating this much needed route without causing damage to the root structure of the existing trees.

The designers selected our InfraWeb 200mm Tree Root Protection no dig system to build an access road above existing soil over the RPA of the mature trees.

The road initially was used for construction traffic then ultimately it will provide access for visitors to the new leisure facilities being constructed.

Additional parking spaces were designed using our Gravel Pro 35 porous paving system. The Gravel Pro is a recycled grass / gravel retention system that provides an attractive alternative to hard paving and asphalt. The Gravel Pro 35 was placed on our InfraWeb TRP system to reduce the sub base thickness required and also to remove the need for conventional drainage systems. The Gravel Pro is providing additional parking for over 130 vehicles.



Infra Green presented their InfraWeb product to us and gave us all the information we needed to reassure the Client and Local Authority of its suitability. Also they introduced us to Grass and Gravel Pro that was ideal for the parking elements of our project. - ***Dave Bathurst Buro Happold***

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3.8 Removal of Ground Protection & Post Construction Landscaping & Treatment

3.8.1 The tree protection may be removed upon completion of the construction phase and when all drainage and service runs have been installed and any site machinery has been removed from the RPA.

3.8.2 Following the developing phase, impacted trees within the site boundary, identified for such treatment, will receive remedial soil remediation treatment: deep root fertiliser / mycorrhizal injection and surface mulching

3.8.3 Any further landscaping works should avoid the changing of ground levels or deep digging. Mechanised cultivation such as rotovation must not be used within the RPA's of existing trees.

3.8.4 If herbicides are to be used they should be appropriate to their purpose and not in such a way as to damage any retained trees or vegetation; they must be applied by a suitably qualified person i.e. a holder of a recognised 'certificate of competence'.

3.8.5 Ideally, retained trees should be within a shrub area as this reduces the chances of compaction and disturbance of root systems.

3.8.6 Any new planting schemes adopted should consider aspects of the site such as current design, layout and future use. Consideration should also be given to the soil type, climate and overall character of the landscape.

4.0 Summary of Proposed Methods

4.1 Table of Impacts and Mitigation

4.1.1 The table below summarises the main areas where trees could become damaged by the proposed development and the methods that need to be adopted in order to prevent such damage:

Table 2: Summary of Proposed Methods

Impact	Mitigation	Reference	Trees Affected
General site access, material storage etc.	Ground protection to acceptable standards.	Paras 2.2.1 & 3.3.3 Tree Protection Plan in Appendix 5	All retained trees
Demolition & construction within existing canopy	Tree surgery	Section 2.1	T1
Demolition of existing build within RPA	Pull down technique within RPA	Section 3.6	T1
Damage to roots caused by new hard landscaping	No dig construction techniques	Section 3.7 & 8	All retained trees

5.0 Completion

5.1 Completion Meeting

5.1.1 Following completion of the works listed above, a Landmark Trees consultant will meet with a local authority representative and agree upon any remedial works deemed necessary. It is the client's duty to notify LT that the project has been completed, in order to facilitate such an inspection.

5.1.2 A separate LT post-development tree inspection (with specific reference to trees identified in the Appendix 1 schedules) is recommended to facilitate a constructive meeting and to monitor the health of some of the more senescent trees on site.

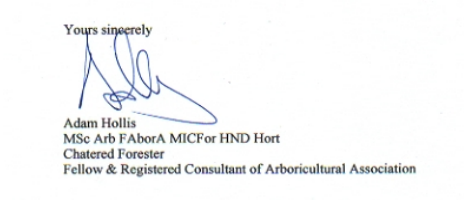
5.1.3 Any works agreed in the above meeting will be confirmed in writing and will be performed to BS 3998: 2010 Tree Works.

5.1.4 Landmark Trees recommend that any work proposed post development is checked to avoid penalty for performing illegal work on a protected tree.

5.1.5 As noted at 1.7 above, it is recommended that, in due course, acceptance of the recommendations in this report is demonstrated by, for example, the architect specifying in writing to the building contractor that tree care conditions apply in execution of the contract, and by an estimate or written undertaking from the contractor to the architect demonstrating that the practical aspects of tree protection recommendations have been priced in to the job.

5.1.6 If conflicts between any part of a tree and the building arise in the course of development these can often be resolved quickly and at little cost if a qualified arboriculturist is consulted promptly. Lack of such care is often apparent quickly and decline and death of such trees can spoil design aims and can of course affect saleability, and reflects lack of best practice. Trees that have been the recipients of careful handling during construction add considerably to the appeal and value of the finished development.

Signed



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Adam Hollis MSc ARB MICFor FArbor A

12th November 2015

For and on behalf of ***Landmark Trees***

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APPENDIX 1: ARBORICULTURAL WORKS

Notes for Guidance:

1, 2, 3 - Urgent (ASAP), Standard (within 6 months), Non-urgent (2-3 years)

RP - Pre-emptive root pruning of foundation encroachments under arboricultural supervision.
CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).*
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
DWD - Remove deadwood.
Fell - Fell to ground level.
FInv - Further Investigation (generally with decay detection equipment).
Pol - Pollard or re-pollard.
Mon - Check / monitor progress of defect(s) at next consultant inspection which should be <18 months in frequented areas and <3 years in areas of more occasional use. Where clients retain their own ground staff, we recommend an annual in- house inspection and where practical, in the aftermath of extreme weather events.
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

*Not generally specified following BS3998:2010

Landmark Trees

Site: 29 New End, Hampstead, London NW3 1JD
Date: 10th November 2015

Surveyor(s): Adam Hollis
Ref: KWA/29NE/AMS

Recommended Tree Works To Facilitate Development

Show All Trees
Hide irrelevant

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
1	Chestnut, Horse	17	920.0	8,7,11 ,7	FInv CL3.5 CR15 Finv= climbing inspection of rot & brace	Bleeding canker (early) Constricted rooting N-S Cobra brace over theatre W Long laterals E fr'm decay'd h'd's Advisable for good arboricultural practice
2	Elm, English	12	349.0	5543	Fell	Early signs of DED; poor form: Included bark in main stem unions Advisable for good arboricultural practice
3	Birch, Silver	18	480.0	7766	Fell	Sparse w. small upper leaves Long low lateral branches Die-back branch tips / clusters Canopy on roof and walls To facilitate development
4	Beech, Copper (TPO)	19	860.0	6996	CL3.5m CB2.5m Cut back only as necessary to clear footprint; i.e. lower SE crown	Remote survey only Branches below 3.5m are <50mm dm. To facilitate development
5	Sycamore	13	230.0	3	Fell	A tree with insignificant defects To facilitate development
7	Sycamore	16	500.0	6759	CR15% DWD	Asymmetry (minor) Deadwood throughout crown Constricted rooting to N & E Advisable for good arboricultural practice

Landmark Trees

Site: 29 New End, Hampstead, London NW3 1JD
Date: 10th November 2015

Surveyor(s): Adam Hollis
Ref: KWA/29NE/AMS

Recommended Tree Works To Facilitate Development

Show All Trees
Hide irrelevant

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
10	Sycamore	16	496.8	2442	Fell	Multi stem weakness Included bark in main stem unions Constricted rooting to S & E To facilitate development
8	Laburnum	6	400.0	2.5	Fell	Ivy smothered Dm estimated For general husbandry/to facilitate development
9	Laburnum	7	290.0	2	Fell	Ivy clad A sparser than normal canopy For general husbandry/to facilitate development
12	Cherry, Kanzan	6	360.0	4534	Fell If not felling within 6 months, CB S limb 25%	A sparser than normal canopy V. limited SULE For general husbandry/To facilitate new
11	Plum, Myrobalan	6	240.0	1411	Fell	A sparser than normal canopy limited SULE@ To facilitate new landscaping
14	Rowan (TPO)	5	80.0	2	Fell Felling and replacement previously agreed with Tree Officer	Remote survey only To facilitate development

APPENDIX 2: GENERAL GUIDELINES

2.1 All work must be to BS 3998:2010 - '*Recommendations for tree work'*.

2.2 Staff carrying out the work must be qualified, experienced and ideally be Arboricultural Association approved contractors, and will be covered by adequate public liability insurance.

2.3 Any defects seen by a contractor or the client that were not apparent to the consultant must be brought to the consultant's attention immediately.

2.4 No liability can be accepted by the consultant in respect of the trees unless the recommendations of this method statement are carried out under the supervision of a Landmark Trees consultant.

2.5 It is advisable to have trees inspected by a consultant regularly. On this site it is recommended that these inspections are made every year.

APPENDIX 3: SAMPLE SITE MONITORING SHEET

Landmark Trees

Site Monitoring Report Sheet

Client:		**Planning Ref:**	
Local Authority:		**Date:**	
Site Address:			
Proposal:			

Visit Checklist	**Y/N**		**Y/N**
Tree protection barrier (TPB) in place		TPB as per approved	
Ground protection (GP) in place		GP as per approved	
TPB / GP breached		Trees damaged	
Site Agent briefed by LT			
LT briefed by Site Agent			
LPA informed			
Remedial action required			

Comments

Recommendations

Outcome		
1		
2		
3		
4		

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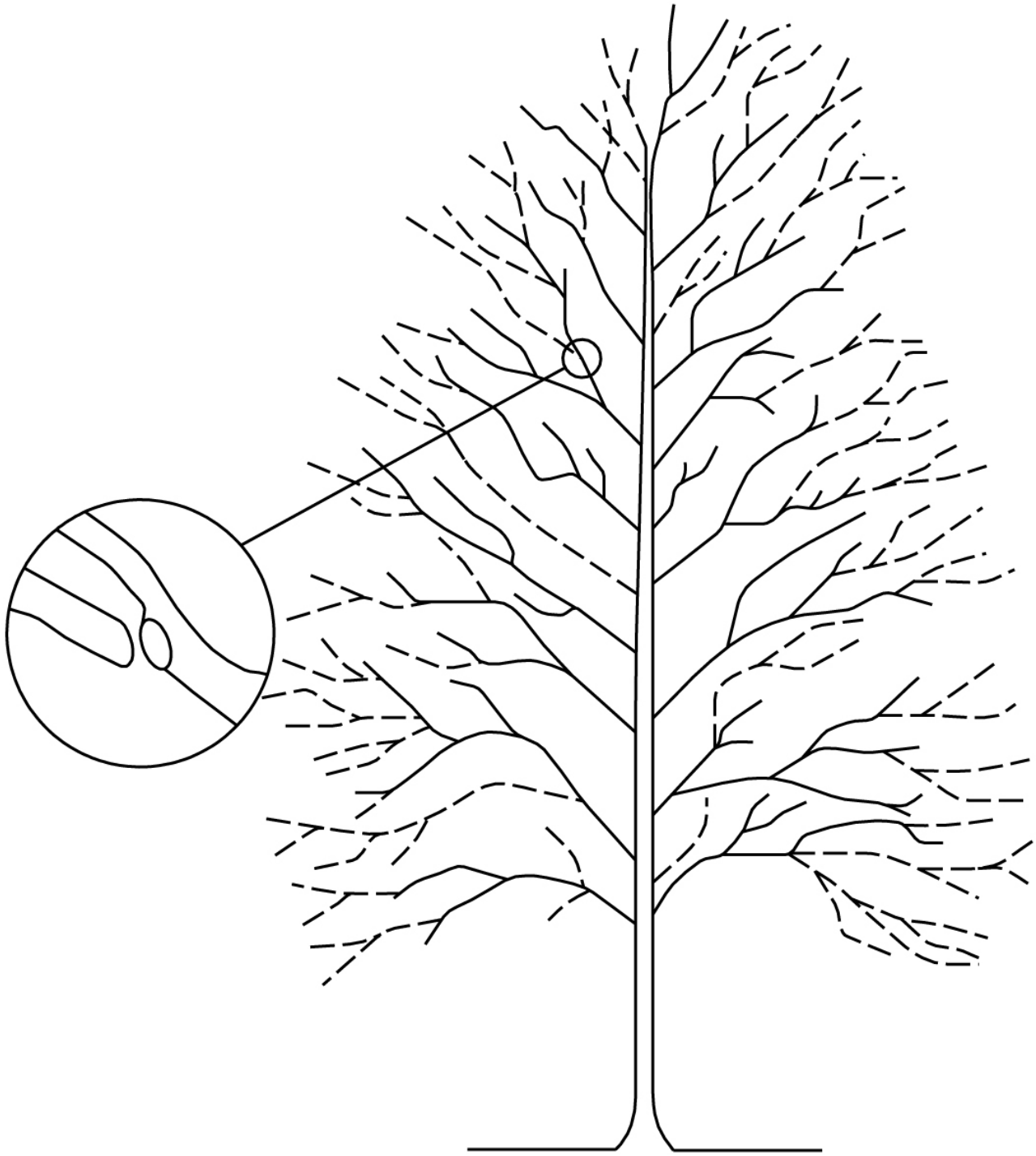
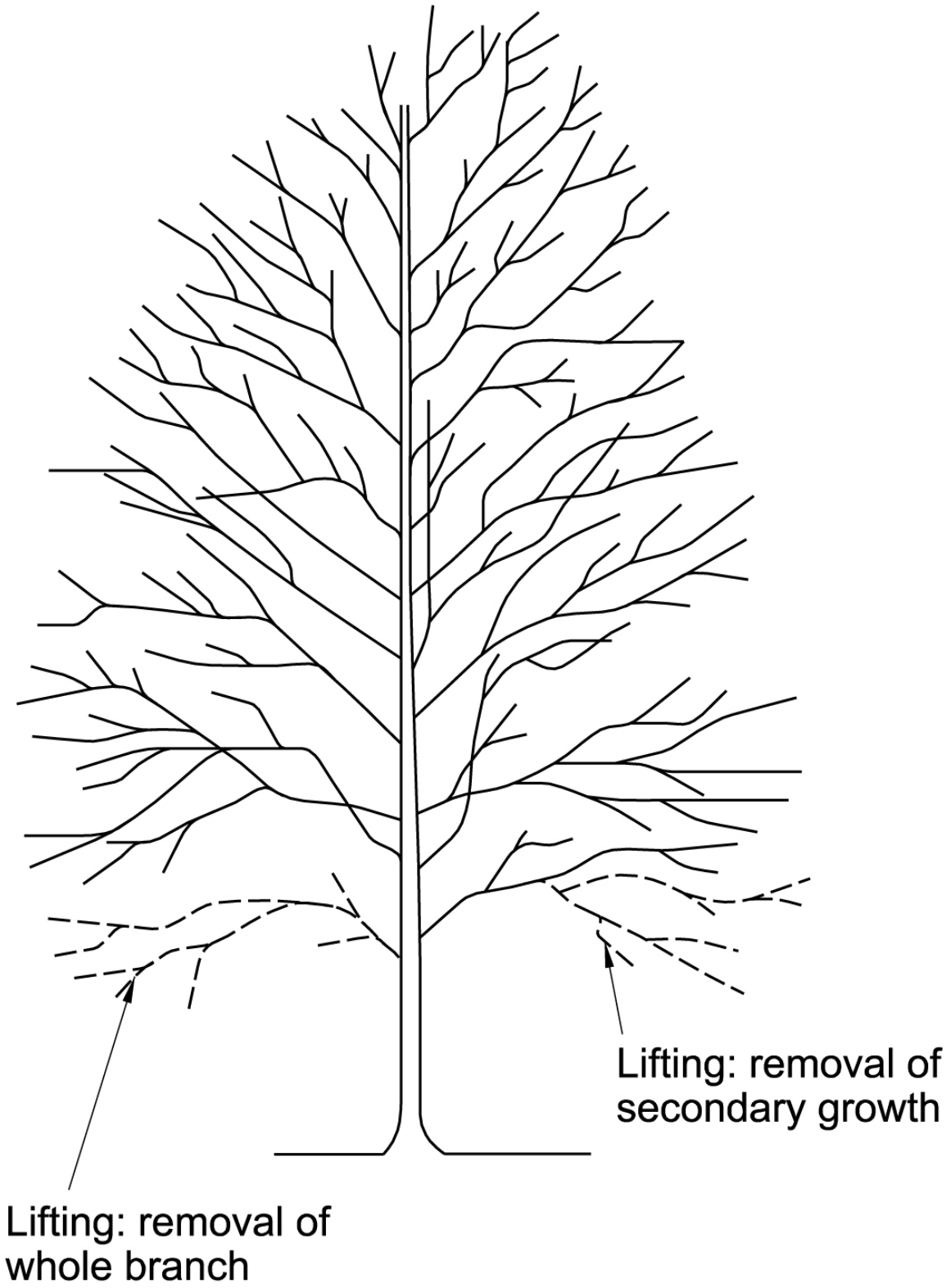
APPENDIX 4: INDICATIVE PRUNING GUIDELINES



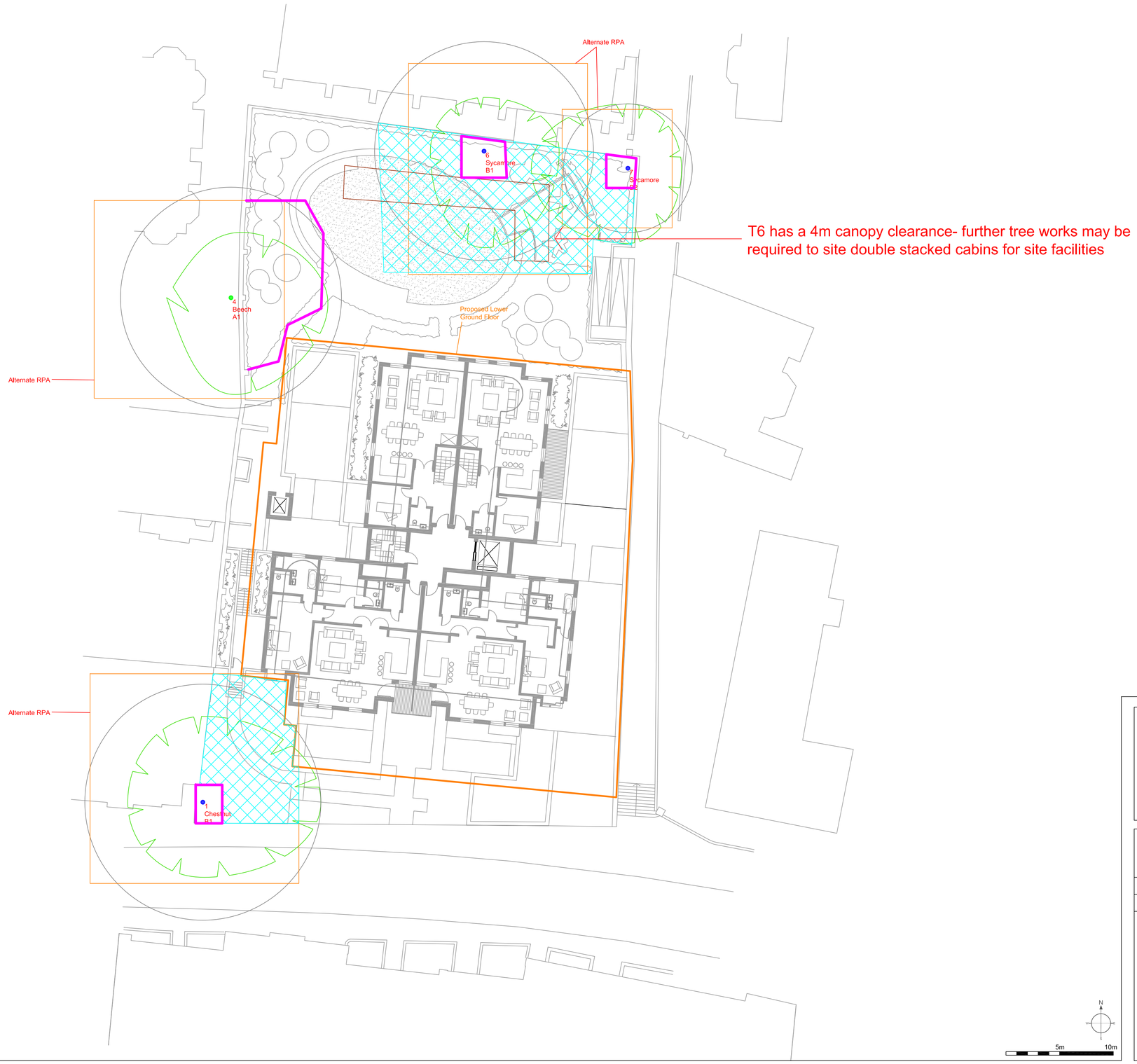
NOTE: Branches pruned back to suitable outward pointing bud or small branch.

REDUCING THE CROWN



CROWN LIFTING

APPENDIX 5: TREE PROTECTION PLAN



NOTE:

This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.

Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

Landmark Trees

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Site: 29 New End, Hampstead, London	1-200@A1
Drawing Title: Tree Protection Plan	November 2015

Key:

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention
- Ground Protection: NB the provision of ground protection on plan does not prohibit the consented laying of services and related works in those areas. It means that those operations should proceed under caution and protect adjacent ground to that immediately requisitioned for the work in hand.
- Tree Protection Fencing