Landmark Trees

ARBORICULTURAL METHOD STATEMENT

Land at 22 Frognal Way

London

NW3 5EX

REPORT PREPARED FOR:

KSR Architects LLP

14 Greenland Street

London

NW1 0ND

REPORT PREPARED BY:

Adam Hollis

MSc ARB MICFor FArbor A MRICS C Env

Ref: KSR/22FW/AMS/01g

Date: 21st November 2019

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Contents

Appendices

1.0 Introduction

1.1 Purpose & Use of the Method Statement

1.1.1 This outline method statement has been prepared for KSR Architects, for assistance with the discharge of planning conditions at Land at 22 Frognal Way, London NW3 5EX: Planning Inspectorate appeal decision APP/X5210/W/16/3150327 of the London Borough of Camden planning application no.: 2015/3530/P. The document will address the following condition:

6) Details of the design of building foundations and the layout, with dimensions and levels, of service trenches and other excavations on site in so far as these items may affect trees on or adjoining the site, shall be submitted to and approved in writing by the local planning authority before any works on site are commenced. The relevant part of the works shall not be carried out otherwise than in accordance with the details thus approved.

1.1.2 The document has been specifically revised to reflect the consented tree removals along the southern boundary of the site and the subsequent amendment of the Tree Protection Barrier in this area.

1.1.3 This document lays down the methodology for any proposed works that may have an effect upon the trees on and adjoining 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.

1.1.4 Copies of this document will be available for inspection on site.

1.2 Terms of Reference

1.2.1 We (LT) are instructed by the client, KSR Architects 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 client has supplied us with a site lay-out plan (15529 A1 (LAND SURVEY)), the current proposals plan (P-090 - LIVING LEVEL PLAN). Engineers Price & Myers have also supplied us with copies of the piling plans (23261 series). The main contractor, My Construction have provided us with a draft copy of their Construction Management Plan as issued on 12th December 2017. We are also reliant upon our own impact assessment report KSR/22FW/AIA/01 and plan overlays of tree constraints contained therein.

1.3 Development Proposals

1.3.1 The principal proposals are for the demolition of existing dwelling and construction of a new family dwelling which includes a basement level.

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
- demolition of existing building & landscaping
- installation of underground services
- main construction
- removal of TPB
- soft landscaping

These works and their arboricultural implications are outlined in sequence below

1.4.2 It will be noted that the piling of the outer walls of the basement has been completed, references to the methodology to be used for its installation are retained herein in the interests of consistency with previously issued revisions of this document. Similarly, references to pre-development site works and site supervisory visits are also retained.

1.5 Site Supervision

1.5.1 A site manager will be nominated to be responsible for all arboricultural matters on site. A pre-commencement site briefing/meeting between the site manager and arboricultural consultant will be held (see Table 1 below); the site manager's details will be noted in the minutes to / report for this meeting (and issued to the London Borough of Camden). During this meeting, all the tree protection methods below will be studied and familiarization undertaken with the requirements of this AMS. The site manager will also:

- be present on site for the majority of the time;
- 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 Arboricultural consultant in the event of any tree related problems occurring, whether actual or potential, in accordance with a tree protection protocol (see section 1.6 below).

1.5.2 At this stage, the nominated Key Personnel are as follows:

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

Site Manager
TBC

1.6 Supervision Schedule & Contingency Protocol

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 other suitably qualified and experienced arboriculturalists at pre-determined and agreed time intervals as indicated in Table 1 below. In addition to specific task supervision, general monitoring of protection measures will be undertaken at least once per month, coordinated where practical with visits detailed in Table 1.

1.6.2 Routine visits will generally be unannounced. However, the arboriculturalist will also visit subject to advance notification (2 weeks) and agreement to supervise any agreed works within the RPA, in accordance with table 1 below.

1.6.3 In the event of any unplanned incursion / accident / spillage within the RPA, the site agent should notify (by telephone) the retained arboricultural consultant immediately. The consultant will provide advice and attend site as soon as possible. This may require the stoppage of all or part of the works in the vicinity of the tree. The consultant will notify the LPA Tree Officer of the nature and extent of damage, the mitigation strategy and likely prognosis. The current contact details of the LPA Tree Officer are:

Nick Bell Tel: 0207 974 4444
Aboricultural Officer
LB Camden
nick.bell@camden.gov.uk

1.6.5 The site monitoring sheet in Appendix 3 will be used to provide photographic evidence, indicate the remedial action required and timescales for remediation completion. The consultant and officer will further liaise as necessary (perhaps meeting on site) until the officer is satisfied that protection measures are again satisfactory. The action in response to incidents will be commensurate with and appropriate to the nature of any such incident. Any breach of the stipulated timescale for remediation will trigger a further monitoring report.

1.6.6 Supervision will require the arboriculturalist to be present throughout all such designated operations (works within the RPA) to ensure tasks are carried out as per the approved methodology, and to ensure the arboricultural objectives were met.

1.6.7 The Local Authority will be accorded free access to the site for tree-related matters subject to H&S requirements; as noted at 1.6.3, any problems will be reported directly to the Arboricultural consultant, who will then visit the site and make recommendations to the developer on how best to rectify the situation and ensure implementation. As noted in Table 1 below, 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 the London Borough of Camden 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.

1.6.8 Landmark Trees will be instructed to provide the above monitoring. In the absence of routine payment (as per our business terms), routine monitoring will cease (temporarily or permanently) and the London Borough of Camden 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 London Borough of Camden.

Table 1: Site Monitoring Visits

Supervision Visit No:	Details	Lead-in time required by LT	Action
Visit 1: Pre-Development Site Inspection (S.2.3 of AMS)	• To include construction Site Agent briefing (S.1.5). • To confirm position of protective measures and that they have been erected in accordance with AMS (S.2.2 & 3 and Tree Protection Plan in Appendix 7); • 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).	Minimum 2 weeks	Issue a brief report with findings to Architect and Main Contractor within 5 days of site supervision visit (Site Monitoring Sheet in Appendix 3).
Visit 2: Installation of any new services within RPA (S3.4) subject to consent for works	• Attend any excavation within RPA's where arboricultural supervision is prescribed by the AMS to ensure work is undertaken in accordance with NJUG provisions or other specification. • Date to be confirmed following formal project planning. • 2 weeks prior notice required.	Minimum 2 weeks	Issue a brief report with findings to Architect and Main Contractor within 5 days of site supervision visit (Site Monitoring Sheet in Appendix 3).
Visit 3: Arboricultural supervision of construction within RPA	• Confirm position of any additional temporary ground protection and that temporary ground protection is in accordance with AMS. • Attend any excavation within RPAs where arboricultural supervision is prescribed by the AMS and any other unplanned incursions into the protection areas (subject to Local Authority agreement as noted above). • 2 weeks prior notice required.	Minimum 2 weeks	Issue a brief report with findings to Architect and Main Contractor within 5 days of site supervision visit (Site Monitoring Sheet in Appendix 3).
Ongoing Monitoring Visits	• Periodically during 12 months (or longer) of entire project. • Visits will be based on intensity of site operations, but at a minimum of monthly visits. • Attend site to confirm protective measures are still in place / can be removed at appointed times. Ensure attendance is timed for any other key elements of proposed (and any other unplanned) incursions into the protection areas. • Pre-start landscape meeting with main contractor to confirm ongoing tree protection measures.	TBC as project progresses	Issue a brief report with findings to and Main Contractor within 5 days of site supervision visit. (Site Monitoring Sheet in Appendix 3).
Final Site Visit - Completion of construction phase supervision visit (S.5)	After it has been confirmed that the landscape phase is complete. Specify any remedial work if necessary.		Issue a brief report with findings to Architect and Main Contractor within 5 days of site supervision visit. (Site Monitoring Sheet in Appendix 3). Provide signed arboricultural checklist (see Appendix 3)

2.0 Pre- Development Site Preparation

2.1 Arboricultural Works

2.1.1 All works recommended to facilitate development have been completed but there are works recommended in the interests of sound husbandry, these are listed in Appendix 1.

2.1.3 A number of separate Section 211 notices have been submitted to LB Camden to notify them of the intent to remove T's 6-9 in order to facilitate the landscaping design. LB Camden raised no objection to these removals and accordingly our TPP has been updated to reflect the removal of these trees and realignment of the protective fencing in that area.

2.2 Installation of Tree Protection Barrier

2.2.1 The Root Protection Area (RPA) indicates the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. The default position is for the RPA's to be fully fenced off to form the boundary of the Construction Exclusion Zone (CEZ), an area based on the RPA, from which access is prohibited for the duration of the project, including the storage of any works materials and equipment.

2.2.2 A Tree Protection Barrier [TPB] comprising steel mesh panels of 2.4m in height ('Heras') will be erected to protect trees. 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). The TPB should carry waterproof warning notices denying access within the RPA.

2.2.3 This TPB is to be erected before any work (other than tree surgery) 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. It should be maintained to ensure that they remain rigid and complete. Where minor work is deemed necessary prior to the erection of fencing a Landmark Trees representative should be forewarned to enable their presence to oversee the work being carried out.

2.2.4 The location of the TPB is shown in the Tree Protection Plan at Appendix 7; it is partly installed already from the previous application.

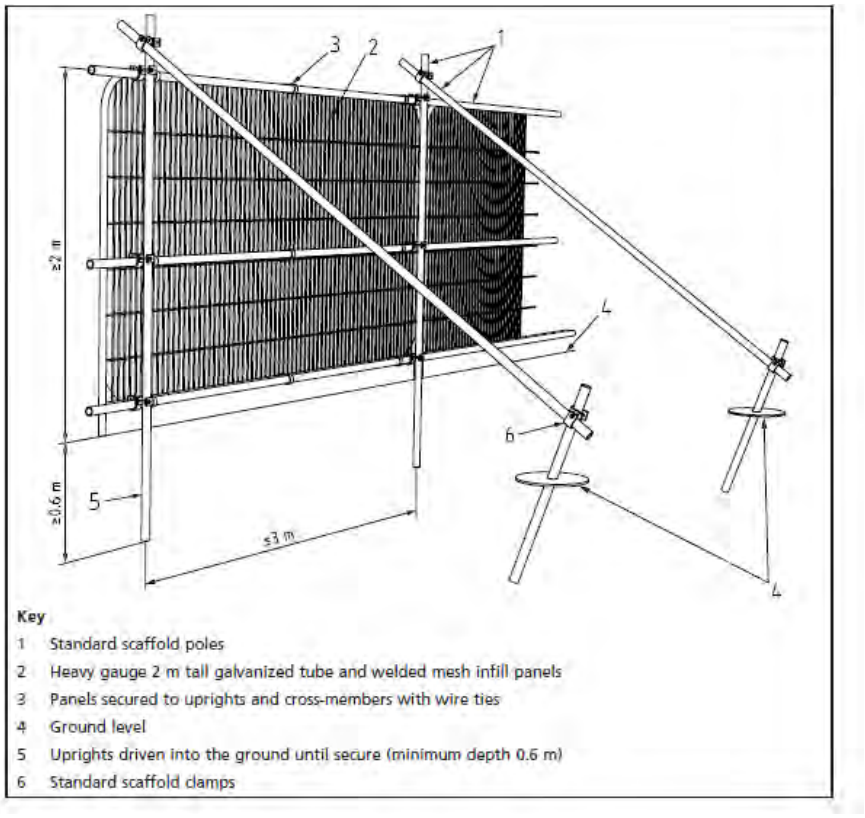


Fig. 1 Tree Protection Barrier Specification
(Source: Figure 2 from BS5837 - Default specification for protective barrier)

2.3 Ground Protection

2.3.1 Extant areas of RPA that cannot be fenced off and therefore lie outside the CEZ must be protected with fit-for-purpose ground protection. The location of the ground protection is shown in the Tree Protection Plan at Appendix 7.

2.3.2 In order to provide this ground protection, Ground Guard MultiTrack mats are to be installed. These lightweight mats are capable of supporting a load of up to 120 tonnes and are to be secured in place using their integral fasteners.

3.0 Development Phase

3.1.1 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.
- 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 hoarding without the approval of an arboriculturist.

3.1.2 The procedures for dealing with variations and incidents are detailed in S1.6.

3.2 Working within Root Protection Areas (RPA)

3.2.1 Although the default position is to exclude all construction activity from the RPA, this degree of protection is not entirely possible on the site: it is necessary to perform some works (in part) within the RPA i.e. formation of basement level and landscape remodelling.

3.2.2 All involved parties will need to be made aware of this need for operations within RPAs; in these instances, careful and supervised working, as described in sections, S. 3.6 (construction) and S. 3.7 (landscaping) will be required.

3.3 Site Access, Accommodation & Storage

3.3.1 Site access and accommodation will be as per the layout within our Tree Protection Plan (App. 5), making use of an area well away from retained trees.

3.3.2 Pedestrian access will run parallel, but separate to vehicular access.

3.3.3 Delivery lorries will be excluded from RPA's by tree protection fencing. 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 and stored throughout the interior of the site away from protected trees.

3.3.4 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 in use.

3.4 Routing & Installation of Services

3.4.1 Integration's combined services layout drawing 442 INT.SK.180201 shows that these services passing through the RPAs of T's 5 – 9. In order to prevent potentially significant damage to these trees, a semi-trenchless approach shall be adopted whereby an air spade will be used to excavate trench sections through RPAs, preserving roots >50mm diameter. Individual sections of pipe will then be manually threaded through gaps at the surface and under the preserved roots / root masses. Any pruning of roots shall be carried out with a sharp pruning saw or secateurs back to a junction. **Roots larger than 25mm diameter may only be cut in consultation with an arboriculturalist.**

3.5 Demolition Measures

3.5.1 All plant and vehicles engaged in demolition works should either operate outside the RPA, or should run on a temporary surface designed to protect the underlying soil structure. The demolition of the building should proceed inwards in a "pull down" fashion.

3.5.2 If the weather is "dry," the site will be watered down to reduce dust travelling to adjacent properties. 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.

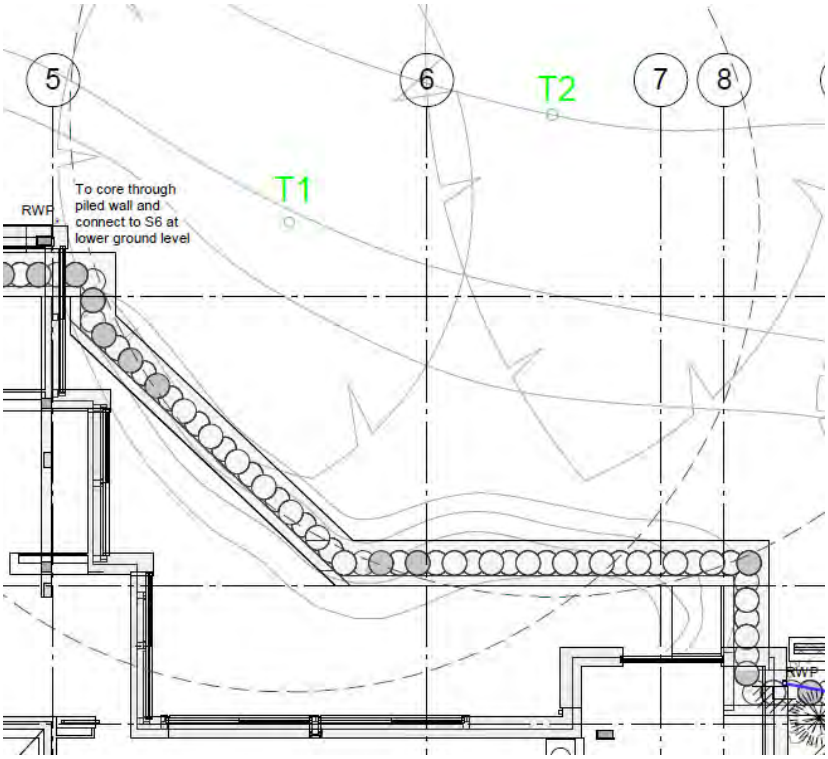
3.5.3 All spoil is to be loaded into trucks reversing into site from the road. Trucks to be fitted with loading grabs.

3.6 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.

3.6.1 The path of the basement foundations and associated secant piling through the theoretical RPAs of T1 and T2 will be manually excavated to 750mm depth under arboricultural supervision; any roots encountered within the trenches / pits will be cleanly pruned back to an appropriate junction with a sharp pruning saw or secateurs back to a junction. **Roots larger than 25mm diameter may only be cut in consultation with an arboriculturalist.**

3.6.2 The line of the line of the diagonal piled retaining wall shown below is positioned so that the back face of the piles is in line with the modified RPAs of T1 and T2. Due to this, the void behind the piled wall will now need to be backfilled to provide stability to the soil bank behind it. In the temporary condition, the level will be built up for the piling mat with compacted hard core. A piling rig exclusion zone shall be noted on drawings issued by Price & Myers outlined by the RPAs. All piling for this wall will be done from the southern side to prevent loading onto the bank. In the permanent condition, the piling mat fill will be removed and replaced with coarse textured sandy loam foot tamped in 100mm layers.



Extract 1: Path of diagonal piled wall

3.6.2 During the construction phase and throughout dry periods on site regular hosing down will be carried out to control dust pollution. In the event of dust build up on trees occurring arboricultural advice will be sought and if necessary remedial measures such as hosing down the trees will be taken.

3.7 Removal of Ground Protection & Post Construction Landscaping & Treatment

3.7.1 The tree protection barrier may be removed upon completion of the construction phase and when all drainage and service runs have been installed and all plant has been removed from the site.

3.7.2 The limits of excavation for the landscape remodelling within the RPA of T10 will be undertaken manually; any roots encountered will be cleanly pruned back to an appropriate junction with a sharp pruning saw or secateurs back to a junction. **Roots larger than 25mm diameter may only be cut in consultation with an arboriculturalist.**

3.7.3 The decking around T2 will be installed using a combination of 150mm screw piles and two 900x900x150mm concrete pads supported by a 2000x2000x200mm sections of Protectaweb located as per the appended Airspade investigation findings. Wrekin Products (the manufacturer of the Protectaweb) have confirmed that the size of web specified is sufficient for the anticipated loading. This Protectaweb is to be installed in line with the specifications detailed in paragraph 3.7.4. Details of the proposed foundation design are provided within Appendix 6.

3.7.4 Method Statement - Specifications for no dig foundation system for decking around T2:

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

ii. Place Root-tex 30 Geotextile over the area to be protected ensuring laps are a minimum of 300mm. The geotextile should not be trafficked across at any time.

iii. Insert 4 equally spaced steel pins along the width of the 200mm deep panel. Expand the panel over the Root-Tex 30 and the pins, extend to the required length, then pin across the opposite panel end. Pin along the length of the panel each side. If full panels are not being used then ensure the cells have been expanded to their full dimension. The ProtectaWeb panels can be cut to shape if required with a heavy duty Stanley Knife. Staple or cable tie any adjacent panels together.

iv. Infill the Protectaweb cells with clean angular stone (Type 4/20mm or Type 20/40mm), working towards the tree and using the infilled panels as a platform. Use a minimum 25mm overfill of clean angular stone when used in conjunction with a hard surface. If the area is to be trafficked immediately, slightly increase the amount of surcharge overfill to a maximum of 50mm over the ProtectaWeb with 4/20mm or 40/20mm clean angular stone. **No compaction is required of the infill. Do not use a whacker plate or other means of compaction.**

v. The ProtectaWeb system will then be surfaced as below

Concrete

- Place Root-tex 30 separation geotextile over the filled ProtectaWeb.
- Cast the 900x900x150mm concrete slab over the geotextile.

3.7.5 For technical data on the Geotextile membrane and the Protectaweb cellular confinement system always refer to the manufactures guidelines for design and implementation. Further technical advice can be gained from the manufacturer:

Wrekin Products Ltd
Europa Way
Britannia Enterprise Park
Lichfield
WS14 9TZ
www.wrekinproducts.com
01543 440440

3.7.6 All further landscaping and associated ground works within RPA will be carried out manually and carefully with due regard for soil and root protection, avoiding changes of ground levels or deep digging. Mechanised cultivation must not be used within any RPA's.

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 development and the methods that need to be adopted in order to prevent such damage:

Table 2: Summary of Proposed Methods

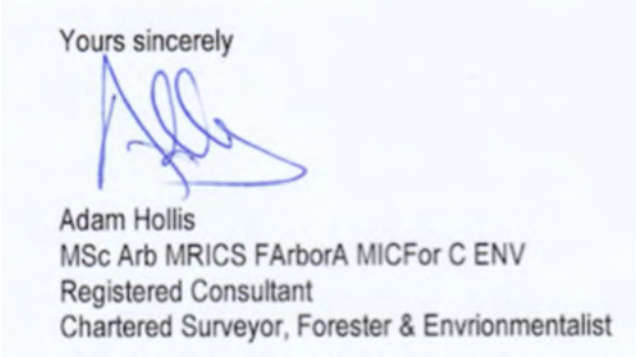
Impact	Mitigation	Reference	Trees Affected
General site access, material storage etc.	Ground protection to acceptable standards.	Paras 2.2.1 & 3.3.3 Tree Protection Plan in Appendix 7	All retained trees
Damage to roots caused by basement foundation excavation within RPA.	Manual excavation of top 750mm of basement line through RPA with pre-emptive root pruning.	Section 3.6	T1 & T2
Damage to roots caused by decking footings within RPA	Mini-screw piles and no-dig foundation design	Section 3.7	T2
Landscape remodelling within RPA	Manual excavation with pre-emptive root pruning.	Section 3.7	T7, T8, T9 & T10

5.0 Completion

5.1 Completion Meeting

5.1.1 Following completion of the works listed above, a Landmark Trees consultant will conduct a walkover survey of the trees to review any defects or signs of ill-health, and inform the local authority in a final report as per Table 1. It is the client's duty to notify LT that the project has been completed, in order to facilitate such an inspection. A separate LT post-development tree inspection (with specific reference to trees identified in the Appendix 1 schedules) is recommended.

Signed



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Adam Hollis MSc ARB MICFor FArbor A

21st November 2019

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

Web: www.landmarktrees.co.uk
e-mail: info@landmarktrees.co.uk
Tel: 0207 851 4544

London Office: Holden House, 4th Floor, 57 Rathbone Place London W1T 1JU
Registered Office: 15 Abbey Road, Oxford OX2 0AD
Landmark Trees is the trading name of Landmark trees Ltd. Registered in Wales. Reg No. 3882076

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

Site: 22 Frognal Way

Date: 27/03/2047

Appendix 1

Recommended Tree Works

Hide irrelevant | Show All Trees

Surveyor(s): Adam Hollis

Ref: KSR/22FRG/AMS

Landmark Trees

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
1	Lime, Common	25	1000	5	Re-inspect on completion of development	Die-back (minor), major storm damage, 30mm Included bark in main stem unions Acute forks from 5m; banana crack NE limb union: Lowest limb has partially failed and held, Remote Recommended husbandry 2
2	Beech, Copper	23	980	10, 9, 7,3	Re-inspect on completion of development	Asymmetry (minor) Rubbing & grafted branches Remote Survey Only Advisable for good arboricultural practice

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 AND ARBORICULTURAL SUPERVISION SIGN OFF CHECKLIST

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		

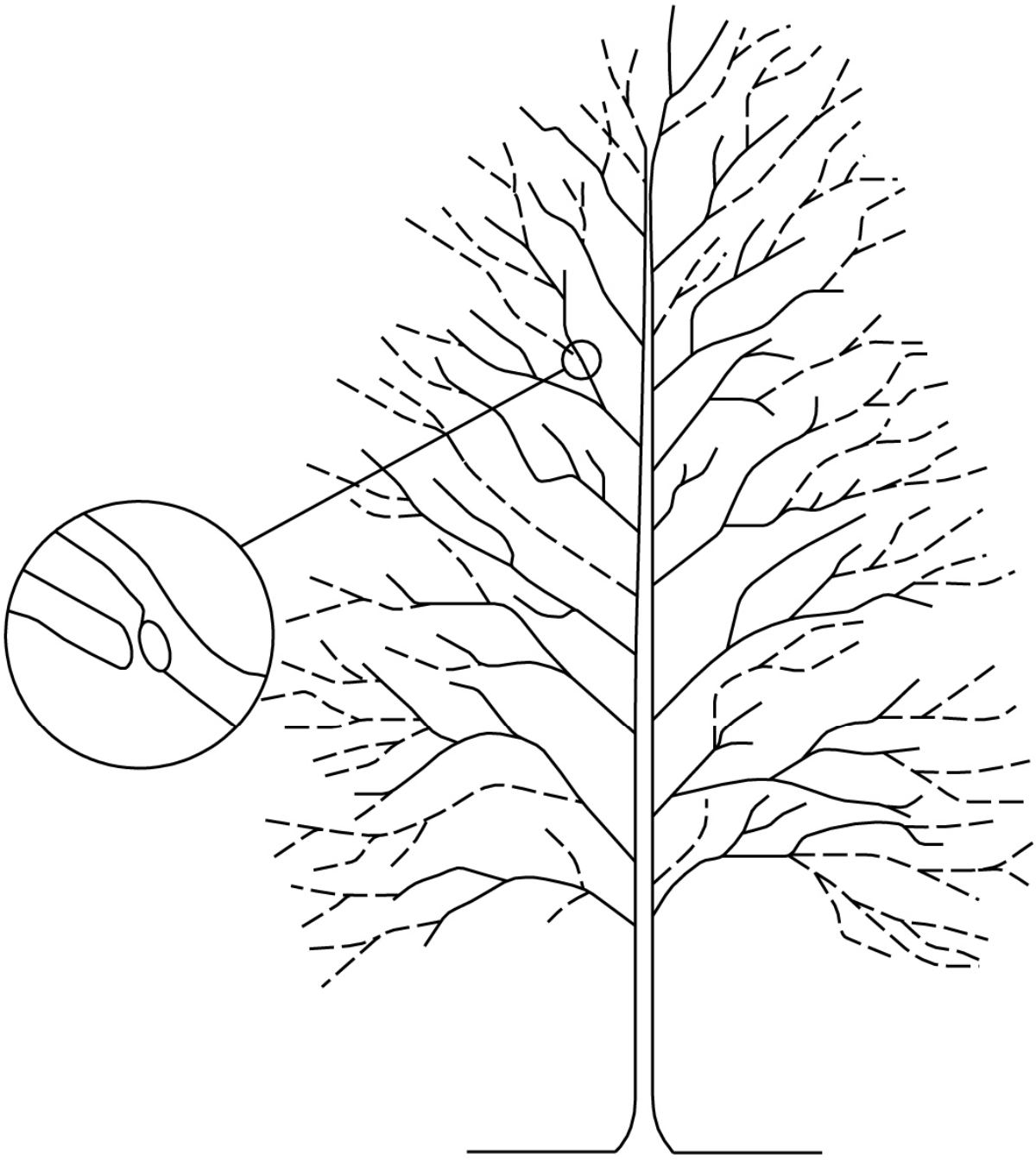
Web: www.landmarktrees.co.uk
e-mail: info@landmarktrees.co.uk
Tel: 0207 851 4544

London Office: 20 Broadwick Street, W1F 8HT, London
Registered Office: Grange Cottage, All Cannings, Devizes, Wiltshire, SN10 3NR
Landmark Trees is the trading name of Landmark trees Ltd. Registered in Wales. Reg No. 3882076

Arboricultural Supervision Sign off Checklist

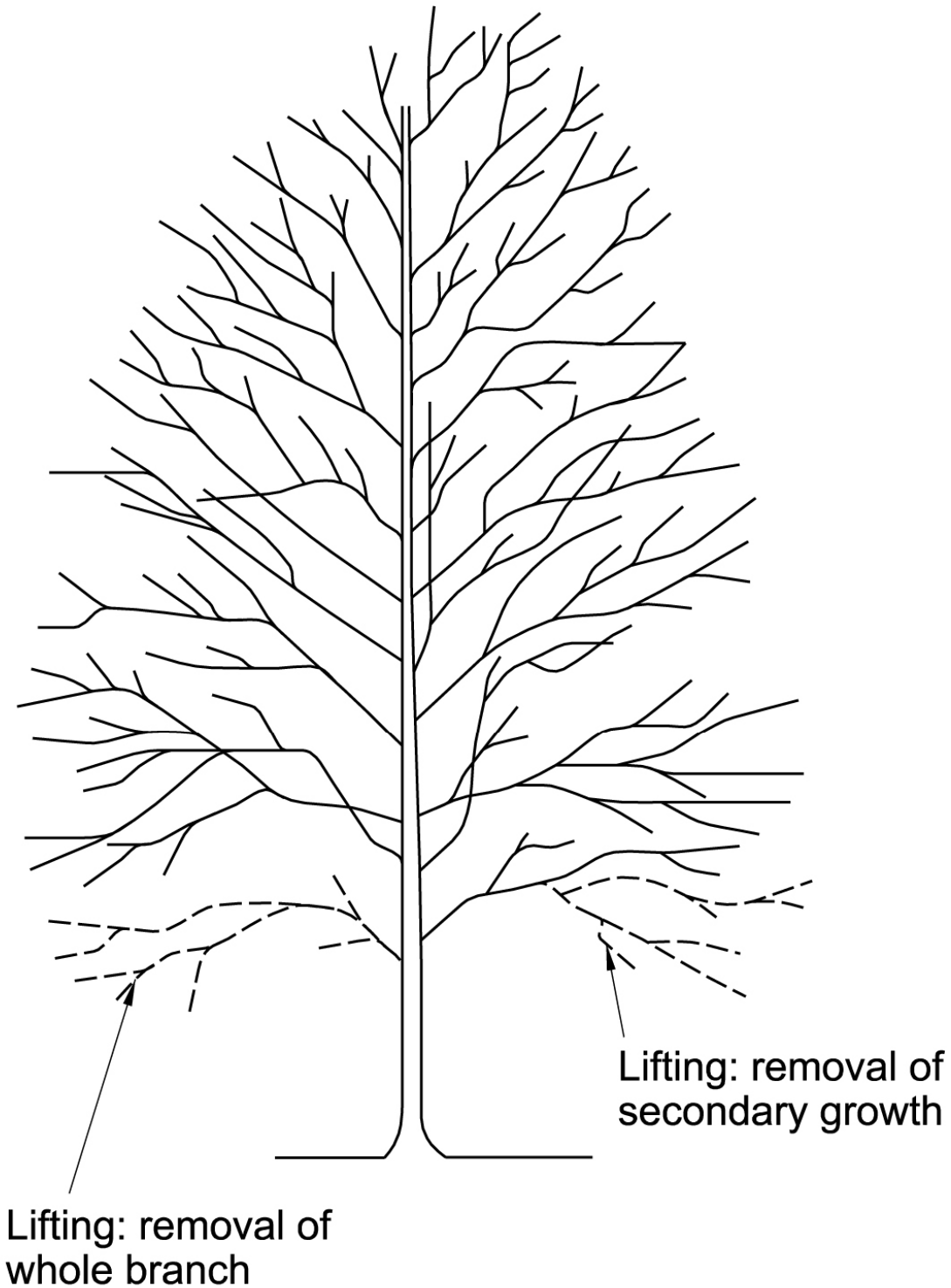
Tree No (s)	Project Phase	Task	Date Completed	Signed (Project arboriculturist)	Signed (Site Manager)
	Pre-commencement	Pre-commencement site meeting to include site manager briefing (S.1.5)			
	Pre-commencement	Confirm the location and specification of the protective measures is in accordance with AMS & Tree Protection Plan (TPP)			
	Pre-commencement	Confirm any tree works have been undertaken in accordance with this AMS (S.2.1/ App 1) and determine if further tree work is required			
	Pre-commencement	Seek required permission for further tree works if necessary.			
	Installation of any new services	Attend any excavation within RPA's where arboricultural supervision is prescribed by the AMS (S3.4) to ensure work is undertaken in accordance with NJUG provisions or other specification.			
	Demolition	Demolition of hard surfaces/ structures within RPA (S3.6) Confirm position of any additional temporary ground protection and that temporary ground protection is in accordance with AMS.			
	Completion of Demolition	Sign off of the demolition phase			
	Construction	Supervised manual excavation of foundations			
	Construction	Installation of 'No Dig' hard surfacing			
	Construction	Additional excavations (if required)			
	Completion of Construction	Completion of construction			
	Post Construction	Removal of machinery and materials from site			
	Post Construction	Dismantle & removal of protective measures			
	Landscaping	Completion of Landscaping			
	Project Completion	Sign off from project arboriculturist			

APPENDIX 4: INDICATIVE PRUNING GUIDELINES



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

REDUCING THE CROWN



CROWN LIFTING

APPENDIX 5: TRIAL PIT FINDINGS

ARBORAERATION
TREE HEALTHCARE SPECIALISTS

Root Excavation Report

22 Frognal Way

London

NW3 6XE

Undertaken by

James Abbott

Arboraeration 15th & 16th October 2019

Introduction

Site Address: 22 Frognal Way, London, NW36XE

Arboraeration were instructed to excavate trial pits at the above property by Adam Hollis of Landmark Trees following a Tree Survey of the site.

Reason for trial pits

Trial pits were excavated on the property to establish the extent of rooting in relation to proposed construction. Plots were excavated using an air spade and manual digging tools.

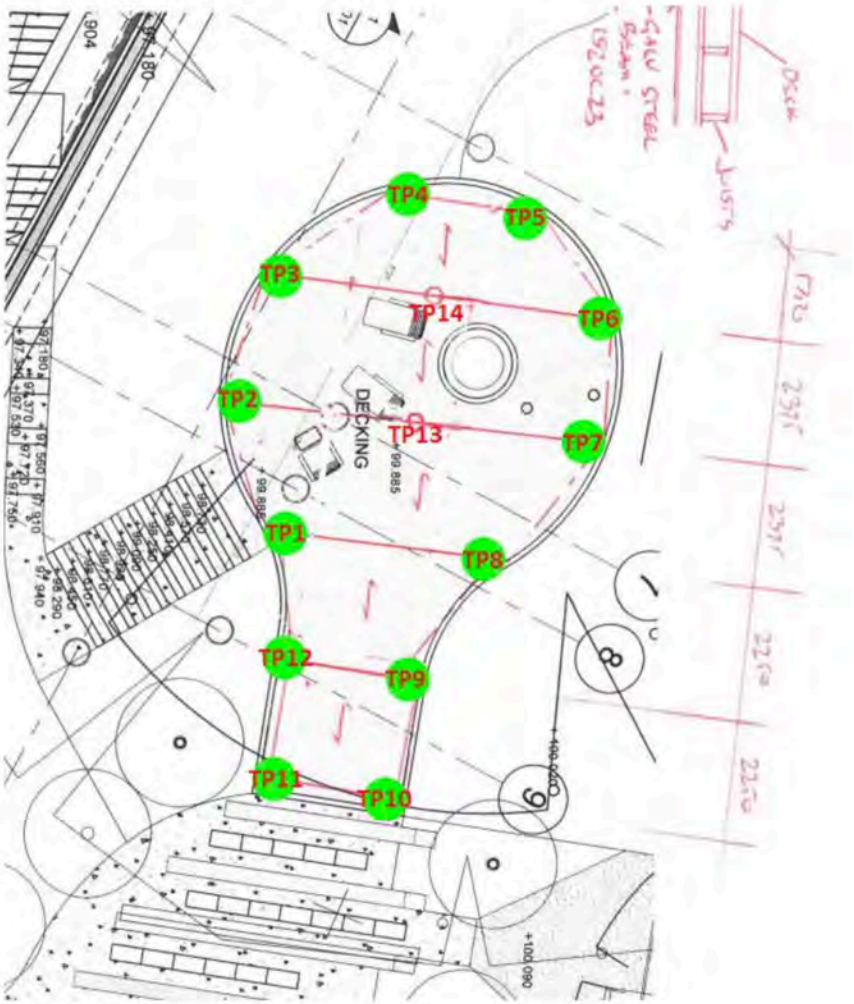
Trial Pit Results – numbered and located as per plans supplied

Trial Pit 1	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 2	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 3	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 4	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 5	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 6	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 7	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 8	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 9	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 10	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 11	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 12	0.4m x 0.4m .0.7m deep Possible location discovered
Trial Pit 13	1.0m x 0.6m .0.7m deep Possible location discovered
Trial Pit 14	0.8m x 1.0m .0.3m deep No possible locations discovered

Further Information

Possible locations are in excess of a 150mm diameter and to a depth of 700mm

Site Layout


TP4
TP5
TP3
TP14
TP6
TP2
TP13
TP7
TP1
TP8
TP12
TP9
TP11
TP10
DECKING
99 885
100 090

Trial Pit 1

Trial Pit 2

Trial Pit 3

Trial Pit 4

Trial Pit 5

Trial Pit 6

Trial Pit 7

Trial Pit 8

Trial Pit 9

Trial Pit 10

Trial Pit 11

Trial Pit 12

Trial Pit 13

Trial Pit 14

APPENDIX 6: DECKING FOUNDATIONS DETAIL

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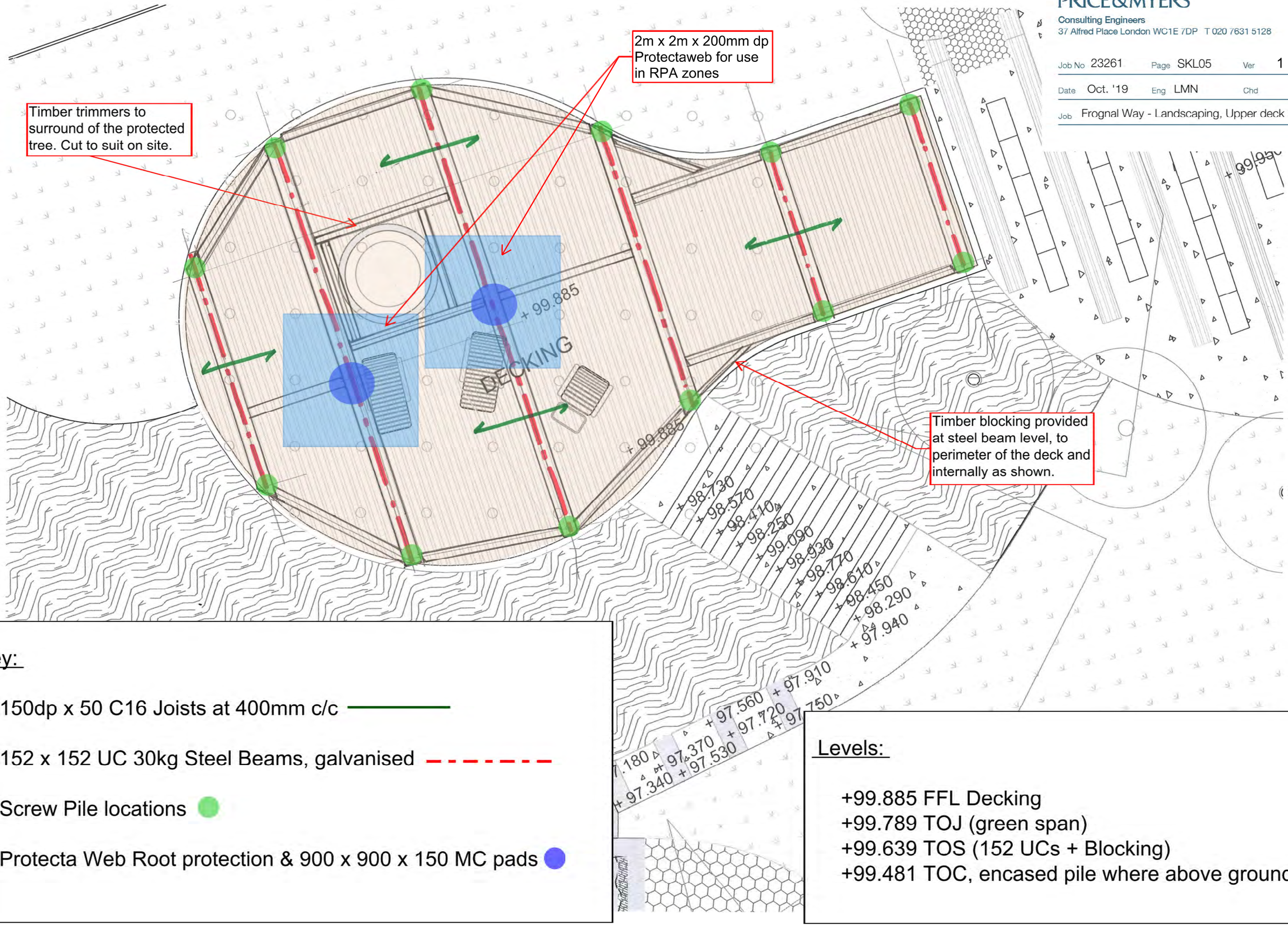
Consulting Engineers
37 Alfred Place London WC1E 7DP T 020 7631 5128

Job No	23261	Page	SKL05	Ver	1
Date	Oct. '19	Eng	LMN	Chd	
Job	Frognal Way - Landscaping, Upper deck				



Key:

150dp x 50 C16 Joists at 400mm c/c

152 x 152 UC 30kg Steel Beams, galvanised

Screw Pile locations

Protecta Web Root protection & 900 x 900 x 150 MC pads

Levels:

+99.885 FFL Decking
+99.789 TOJ (green span)
+99.639 TOS (152 UCs + Blocking)
+99.481 TOC, encased pile where above ground

PRICE&MYERS
Consulting Engineers

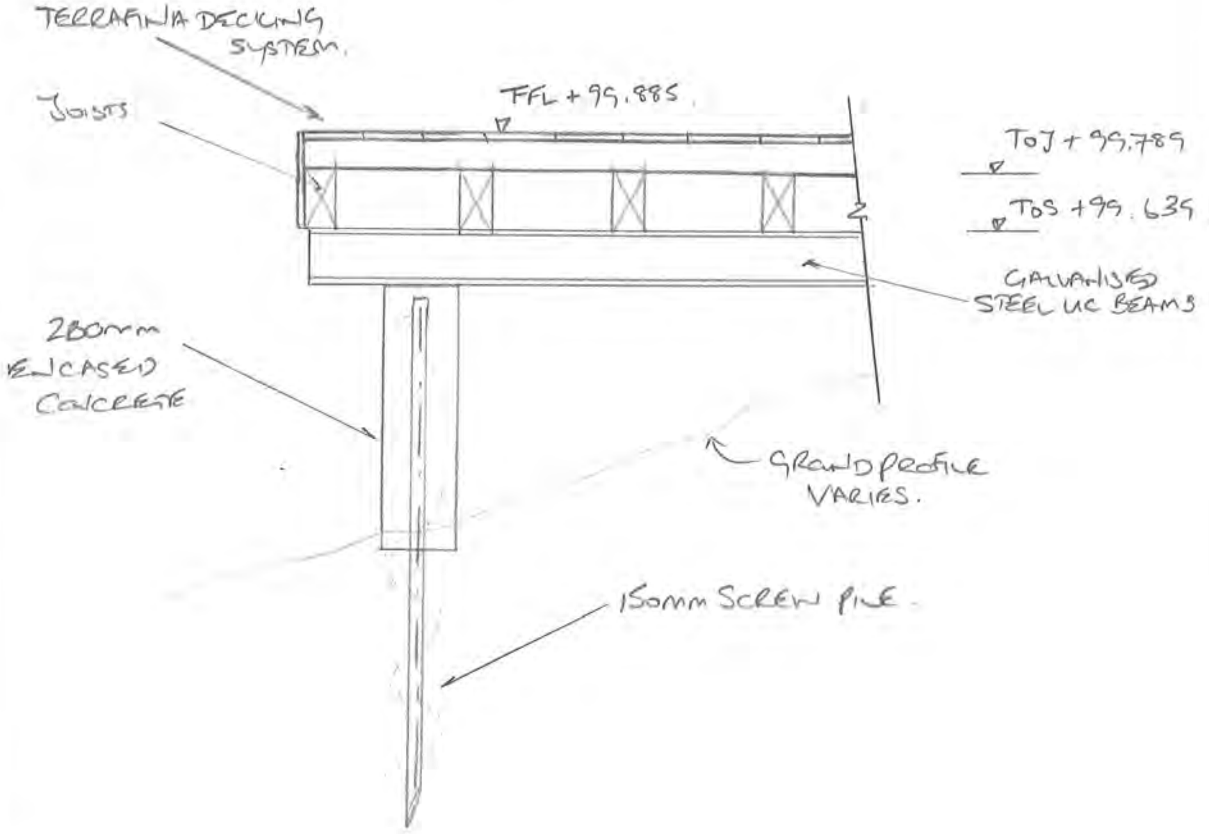
Job No 23261 Page SKL05G Ver

Date OCT.'19 Eng LNM Chd

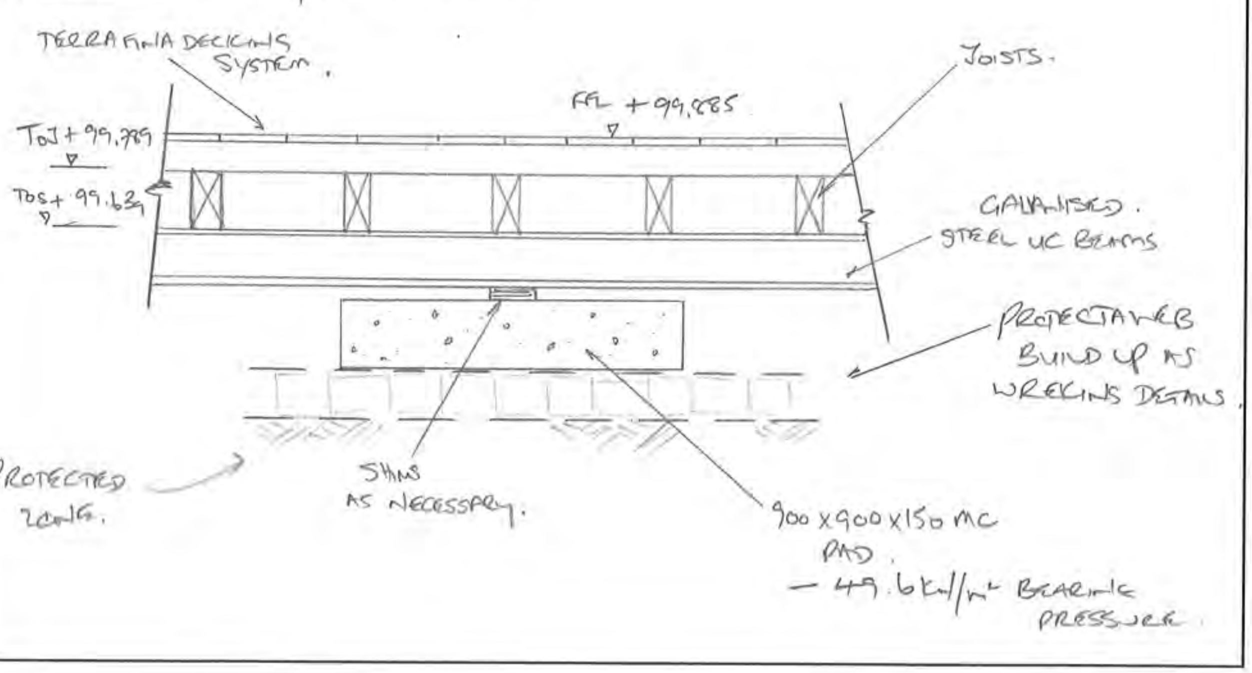
Job FROGNAL WAY - LANDSCAPING

UPPER DECKING DETAILS:

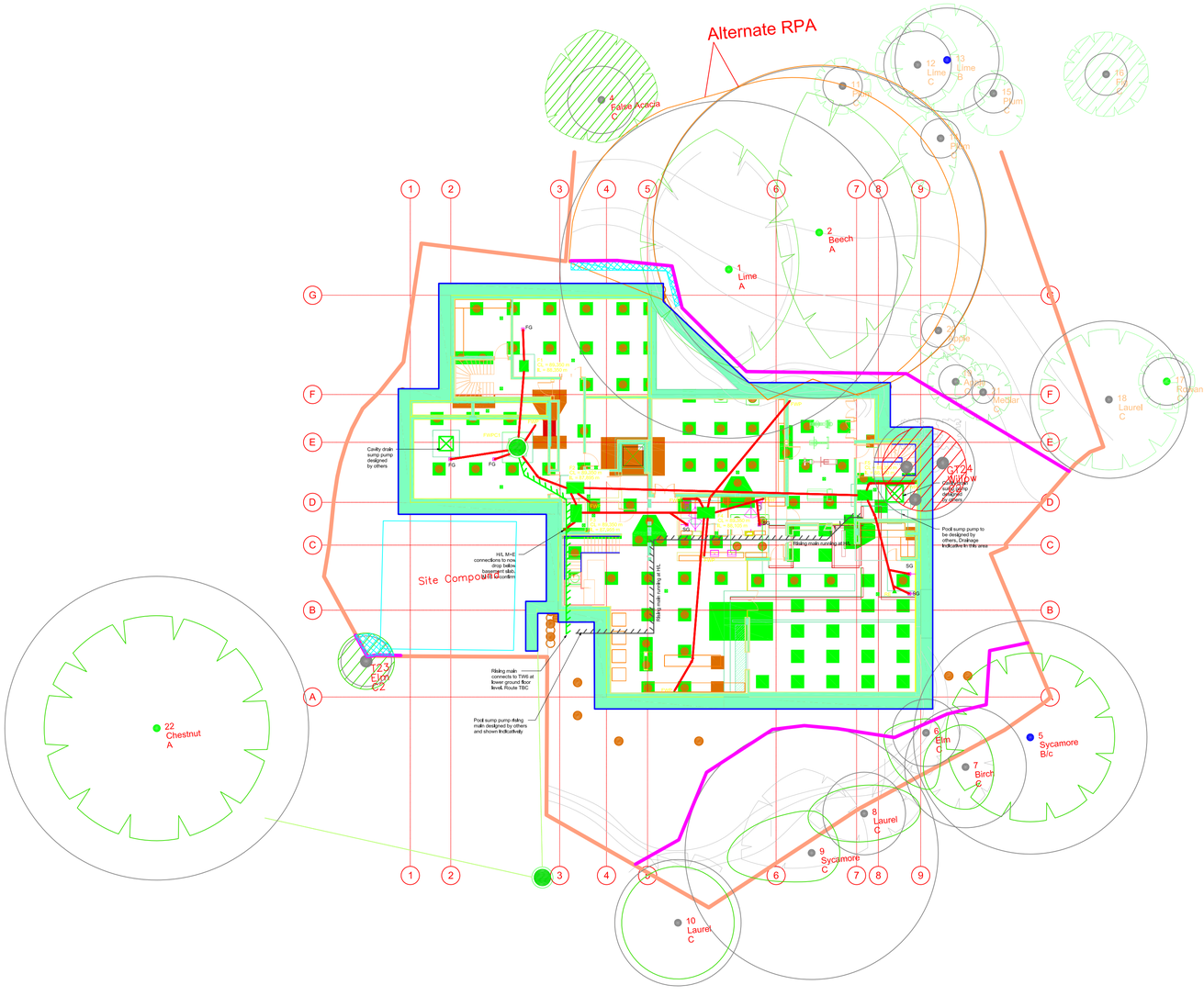
SCREW PILES: TYPICAL DETAIL



PROTECTAWEB: TYPICAL DETAIL



APPENDIX 7: TREE PROTECTION PLAN



Proposed Basement 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

20 Broadwick Street, London, W1F 8HT
Tel: 0207 851 4544 Mobile: 07812 989928
e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 22 Frognal Way	1:200@ A1
Drawing Title: Tree Protection Plan	December 2017

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 Position Approximate (not shown on original survey)
▬	Tree Protection Fencing
○	Tree To Be felled

APPENDIX 8: FOUNDATION DESIGN

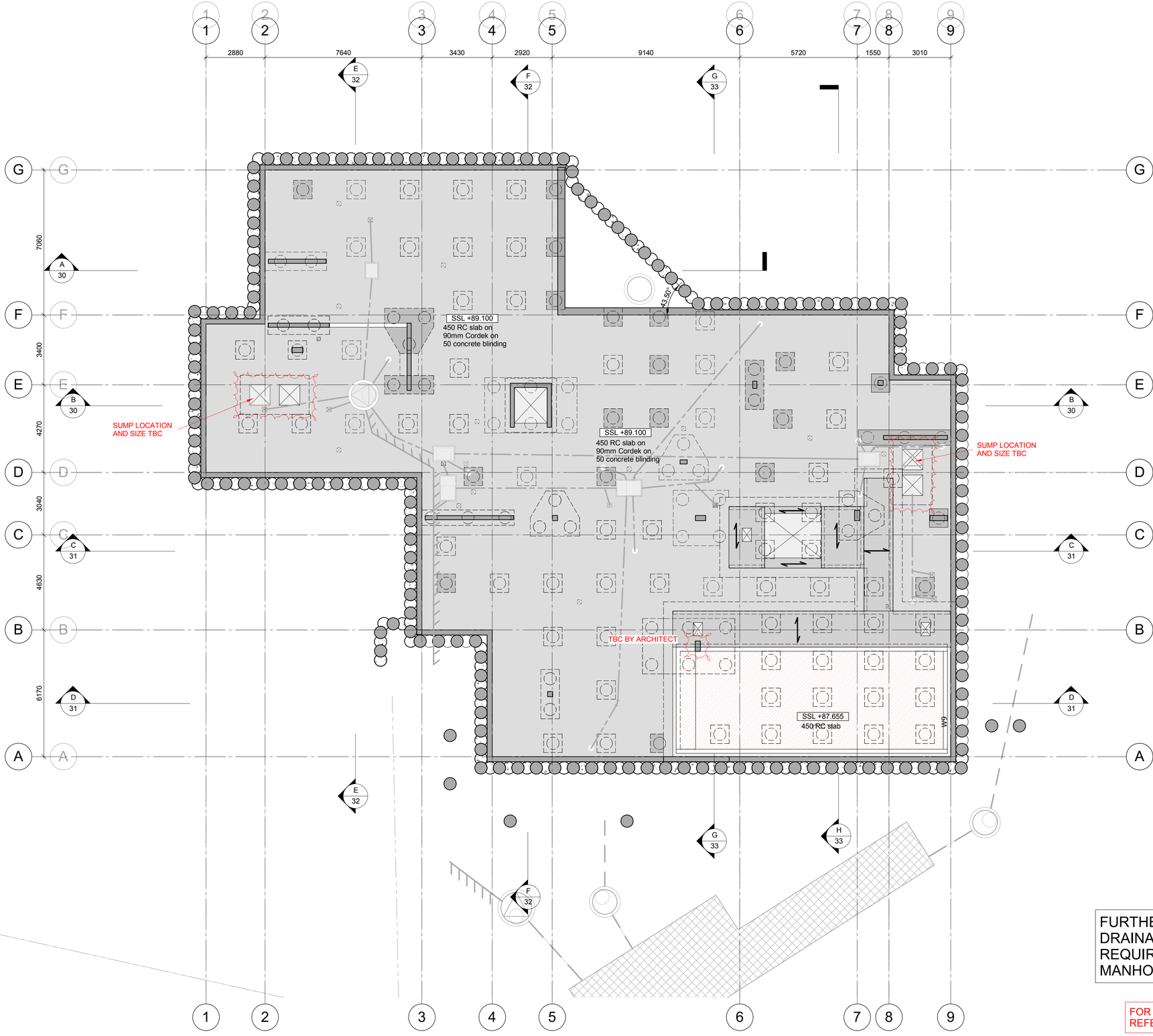
All setting and levels based on Architect's information. Dimensioned information from Gridline to take priority over co-ordinates

Piles and ground works to be co-coordinated with ground source heat pump geothermal boreholes, designed by others

Secant pile wall designed by specialist sub contractor to retain all surcharges, earth pressures and hydrostatic pressures. Final hydrostatic design pressure to be agreed with P&M

Waterproofing to specialist subcontractors design. Allow for waterproof concrete in lift pit, spa depression and swimming pool box.
For additional waterproofing details refer to drawings No. 23261/131

Cordek Cellcore HXS under slab. Cordek Cellcore HX-B under pile caps. 90mm grade 18/24 to act as heave protection and combined insulation.



FURTHER CO-ORDINATION OF DRAINAGE AND STRUCTURE REQUIRED AT BASEMENT LEVEL. MANHOLE PITS NOT SHOWN.

FOR INFORMATION AND SETTING OUT REFER TO DRAWINGS 23261/108-111

Notes :-

1 This Drawing is to be read in conjunction with all relevant Architect's Engineer's and specialists' drawings and specifications.

2 Do not scale from this drawings in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale this bar should be 50mm long @A1 or 25mm long @ A3

3 Health & Safety :
All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".

4 For general notes and RC estimate refer to drawing No. 23261/GN01

5 Pile setting out based on tolerances:
Plan: 75mm
Vertical: 1:75

6 For set out of piles and piled wall refer to drawings No. 23261/100 -103

7 All setting out and levels are based on Architect's information.

8 Set out of piles to gridline to take priority over supplied co-ordinates.

9 All co-ordinates supplied to be confirmed on site by Contractor.

Ver	Date	Drawn	Eng	Amendment
T1	20.11.17	SKV	BR	Issued for Tender
P6	08.09.17	SKV	BR	Issued for Information
P5	08.06.17	SKV	BR	Issued for Information
P4	02.06.17	SKV	BR	Issued for Information
P3	23.05.17	SKV	BR	Piles and note added. Column size revised
P2	17.05.17	SKV	BR	Issued for Information
P1	04.05.17	SKV	BR	Issued for Information

22 FROGNAL WAY LONDON. NW3 6XE

PROPOSED BASEMENT PLAN

Status
FOR INFORMATION
NOT FOR CONSTRUCTION

Drawn	S. Varsani	Eng	B. Rabjohns
Scales	1:100 @ A1		1:200 @ A3
Drawing No	23261 / 09	Ver	T1

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Consulting Engineers
37 Alfred Place London WC1E 7DP
020 7631 5128
mail@pricemyers.com www.pricemyers.com

All setting and levels based on Architect's information. Dimensioned information from Gridline to take priority over co-ordinates

Piles and ground works to be co-coordinated with ground source heat pump geothermal boreholes, designed by others

Secant pile wall designed by specialist sub contractor to retain all surcharges, earth pressures and hydrostatic pressures. Final hydrostatic design pressure to be agreed with P&M

Waterproofing to specialist subcontractors design. Allow for waterproof concrete in lift pit, spa depression and swimming pool box.
For additional waterproofing details refer to drawings No. 23261/131

Cordek Cellcore HXS under slab. Cordek Cellcore HX-B under pile caps. 90mm grade 18/24 to act as heave protection and combined insulation.

Notes :-

1 This Drawing is to be read in conjunction with all relevant Architect's Engineer's and specialists' drawings and specifications.

2 Do not scale from this drawings in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale this bar should be 50mm long @A1 or 25mm long @ A3

3 Health & Safety :
All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".

4 For general notes and RC estimate refer to drawing No. 23261/GN01

5 Pile setting out based on tolerances:
Plan: 75mm
Vertical: 1:75

6 For set out of piles and piled wall refer to drawings No. 23261/100 -103

7 All setting out and levels are based on Architect's information.

8 Set out of piles to gridline to take priority over supplied co-ordinates.

9 All co-ordinates supplied to be confirmed on site by Contractor.

1 2 3 4 5 6 7 8 9

2880 7640 3430 2920 9140 5720 1550 3010

G F E D C B A

7060 3400 4270 3040 4630 6170

SSL +93.200
350 RC Slab

SSL +93.000
350 RC Slab

+93.250

250

IN ABEYANCE TBC
BY ARCHITECT

20 FROGNAL WAY

E 32 · F 32 · G 33 · H 33 · A 30 · B 30 · C 31 · D 31

FOR INFORMATION AND SETTING OUT
REFER TO DRAWINGS 23261/112-115

Ver	Date	Drawn	Eng	Amendment
T1	20.11.17	SKV	BR	Issued for Tender
P5	08.09.17	SKV	BR	Issued for Information
P4	08.06.17	SKV	BR	Issued for Information
P3	02.06.17	SKV	BR	Issued for Information
P2	17.05.17	SKV	BR	Issued for Information
P1	04.05.17	SKV	BR	Issued for Information

22 FROGNAL WAY
LONDON. NW3 6XE

PROPOSED
LOWER GROUND FLOOR PLAN

Status
FOR INFORMATION
NOT FOR CONSTRUCTION

Drawn S. Varsani	Eng B. Rabjohns
Scales 1:100 @ A1	1:200 @ A3
Drawing No 23261 / 10	Ver T1

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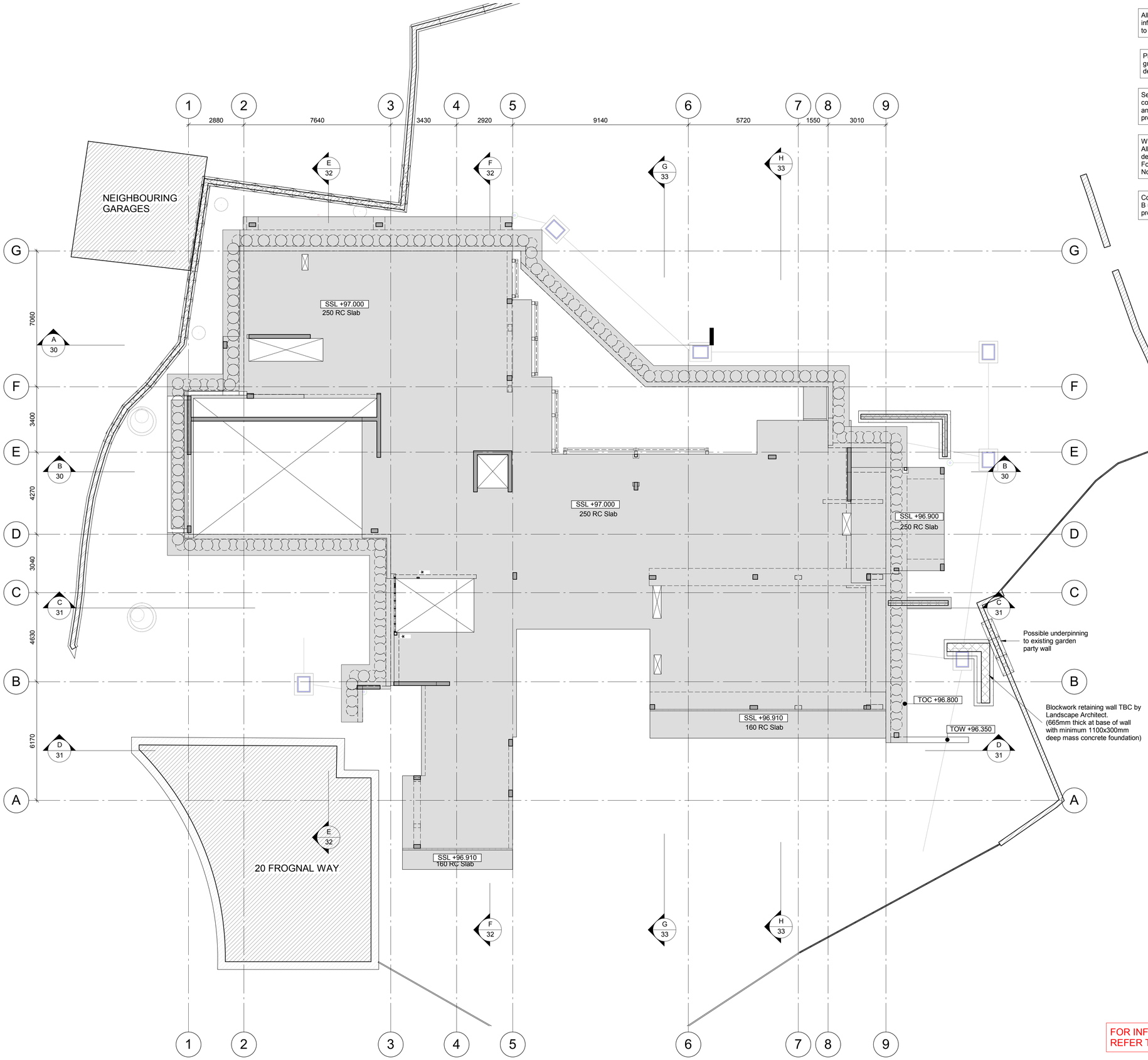
Consulting Engineers
37 Alfred Place London WC1E 7DP
020 7631 5128
mail@pricemyers.com www.pricemyers.com



All setting and levels based on Architect's information. Dimensioned information from Gridline to take priority over co-ordinates

Piles and ground works to be co-coordinated with ground source heat pump geothermal boreholes, designed by others

Secant pile wall designed by specialist sub contractor to retain all surcharges, earth pressures and hydrostatic pressures. Final hydrostatic design pressure to be agreed with P&M

Waterproofing to specialist subcontractors design. Allow for waterproof concrete in lift pit, spa depression and swimming pool box.
For additional waterproofing details refer to drawings No. 23261/131

Cordek Cellcore HXS under slab. Cordek Cellcore HX-B under pile caps. 90mm grade 18/24 to act as heave protection and combined insulation.

FOR INFORMATION AND SETTING OUT REFER TO DRAWINGS 23261/116-119

Notes :-

1 This Drawing is to be read in conjunction with all relevant Architect's Engineer's and specialists' drawings and specifications.

2 Do not scale from this drawings in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale this bar should be 50mm long @A1 or 25mm long @ A3

3 Health & Safety :
All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".

4 For general notes and RC estimate refer to drawing No. 23261/GN01

5 Pile setting out based on tolerances:
Plan: 75mm
Vertical: 1:75

6 For set out of piles and piled wall refer to drawings No. 23261/100 -103

7 All setting out and levels are based on Architect's information.

8 Set out of piles to gridline to take priority over supplied co-ordinates.

9 All co-ordinates supplied to be confirmed on site by Contractor.

Ver	Date	Drawn	Eng	Amendment
T1	20.11.17	SKV	BR	Issued for Tender
P5	08.09.17	SKV	BR	Issued for Information
P4	08.06.17	SKV	BR	Issued for Information
P3	02.06.17	SKV	BR	Issued for Information
P2	17.05.17	SKV	BR	Issued for Information
P1	04.05.17	SKV	BR	Issued for Information

22 FROGNAL WAY LONDON. NW3 6XE

PROPOSED UPPER GROUND FLOOR PLAN

Status
FOR INFORMATION
NOT FOR CONSTRUCTION

Drawn	S. Varsani	Eng	B. Rabjohns
Scales	1:100 @ A1		1:200 @ A3
Drawing No	23261 / 11	Ver	T1

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Consulting Engineers
37 Alfred Place London WC1E 7DP
020 7631 5128
mail@pricemyers.com www.pricemyers.com

APPENDIX 9: SERVICE ROUTES

NOTES:

1. Do not scale this drawing.
2. Drawing only to be used for the status indicated.

GROUND SOURCE PIPEWORK @ 600 -1000mm DEPTH

BOREHOLES 6 & 5

TREE PROTECTION ZONE

GROUND SOURCE HEAT PUMP FLOW AND RETURN TO BASEMENT PLANTROOM

BOREHOLE 01

TREE PROTECTION ZONE
ALLOW FOR TRENCHLESS DIGGING ACROSS TREE PROTECTION ZONE

PIPEWORK TO BE GROUPED ON 2 BUNCHES

MANIFOLD

BOREHOLES 2,3 &4

TW2
CL = 97.150 m
IL = 94.400 m

TW1
CL = 97.150 m
IL = 94.470 m

TW3
CL = 97.150 m
IL = 94.330 m

TW4
CL = 97.150 m
IL = 94.270 m

TW5
CL = 97.150 m
IL = 94.170 m

TW 2502
CL = 95.300 m
IL = 92.410 m

TW 2501
CL = 94.880 m
IL = 89.760 m

1 Lime A

2 Beech A

18 Laurel C

20 Apple C

19 Apple C

21 Medlar C

5 Sycamore B/c

7 Birch C

8 Laurel C

9 Sycamore C

10 Laurel C

2500

3200

2100

3600

Rainwater harvesting tank to be designed by others. Assumed 1m dp
CL: 92.350
IL: 91.350

Rising main connects to S2 at upper ground level

12000 l pumping station by others

S6
CL = 93.350 m
IL = 92.350 m

S2
CL = 94.000 m
IL = 92.650 m

S3
CL = 93.350 m
IL = 92.400 m

C2
CL = 93.350 m
IL = 92.365 m

C1
CL = 93.350 m
IL = 92.365 m

Ex MH6
CL: N/A
IL: 92.79

SWPC1
CL = 93.350 m
IL = 89.400 m

Pool sump pump rising main from H/L basement

Water feature yard gully drops to foul drainage network below ground

Thames Water adopted manhole to be demolished

Invert level of Thames Water sewer to be confirmed, prior to construction

Invert level of existing manhole beyond the site boundary to be confirmed prior to constructio, if possible

Attenuation tank
Total area = 26.25m²
2.5m deep

Binstore structure to be agreed with Thames Water as this structure is within 3m of the public sewer

Refer to upper ground floor drawing for continuation of SW drainage

RWP
CD
GV
VC

INTEGRATION
40 BOWLING GREEN LANE
LONDON EC1R 0NE
+44 (0)207415 7206
INTEGRATIONUK.COM

PROJECT
22 FROGNAL WAY
22 Frognal Way
London NW3 6XE

TITLE
COMBINED SERVICES
Ground Source Heat Pump
Services Distribution

DATE	SCALE	SIZE
01/02/18	1:100	A1

SKETCH NO.
442 INT.SK.180201

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