ARBORICULTURAL IMPACT ASSESSMENT

INCLUDING

TREE PROTECTION MEASURES

1 Windsor House

5 Eton Avenue

Belsize Park

London

NW3 3EL

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for

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1.0 INTRODUCTION

The purpose of this document is to provide clear instruction on the implementation of protection to trees in close proximity to the proposed construction project.

1.1 Tree protection conditions demand adherence to the guidance offered in British Standard 5837: 2012 Trees in Relation to Design, Demolition and Construction - Recommendations.

a) B.S.5837:2012 is accepted as the exemplar document for development proposals in close proximity to existing trees.

b) This British Standard gives recommendations and guidance on the relationship between trees and design, demolition and construction processes and sets out the principles and procedures to be applied to achieve an harmonious and sustainable relationship between trees and structures

1.2 Once approved, this document must be complied with or enforcement action by the LPA may result.

2.0 LIMITATIONS

Trees are living organisms and subject to change in health and structural condition. Therefore this method statement is intended for use only for up to 12 months from the date of writing.

The trees are protected by the Belsize Conservation Area. Before any tree work is undertaken or development activity commenced within the calculated root protection area, (RPA) it is essential to have the permission of the local Planning Authority (LPA). The above legal constraints apply to trees both on and off site. It is a criminal offence to carry out work on a protected tree without such permission.

3.0 Impact Assessment

The assessment of constraints posed by trees on the proposed building project has been undertaken(see Tree Constraints Plan at 4.0) and is deemed acceptable, subject to adherence to the methodology listed below.

3.1 Evaluation of tree constraints.

3.1.1 The proposed building is sited within the RPA of three off site trees; T2 Beech, T4 Sycamore, T5 Sycamore and two on site tree; T1. Robinia and T3 Birch. It will be necessary to remove T3 Birch, S6 & S7 Euonymus shrubs but, all other trees and shrubs can be protected by means of fencing, plywood cladding and ground protection , as shown on the Tree Protection Plan (T.P.P.) at Section 4.1.

3.1.2 The grassed and graveled rear garden has been constructed of semi permeable membrane on to which a substrate of granular material has been poured and levelled and then topped up with sharp sand. The finishing surface materials are; artificial grass and a serpentine path of sandstone chippings, which cuts through the lawn to the rear of the garden, where a climbing frame and slide is currently located.

3.1.3 The design of the proposed garden room structure relies on the use of ground screw mini piles to found the building. See detail at 3.3.3 These ground screws are to be driven into the ground within the rooting zone of three, off site trees. An above ground raft construction system is to be employed and a systematic sequence of drilling will be adopted.

3.1.4 The height of the sedum roofed garden room will not exceed 2.8 metres in height, which will not interfere with any of the off site crown aprons. Therefore, there is no requirement for any crown pruning.

3.2 Issues to be addressed in the Arboricultural Method Statement (A.M.S.):

a) site construction access

b) intensity and nature of construction activity

c) phasing of construction works

d) space and method of specialist foundation construction

e) laying of subterranean utilities

f) location and size of area required for storage of all temporary equipment, spoil, fuel and materials including the mixing of cement.

g) working space for access around the building.

h) effects of sloping ground in relation to potential flow of harmful liquids

i) record of arboricultural monitoring throughout the project

j) contact list of relevant specialists.

3.3 Arboricultural Method Statement

3.3.1 Site construction access

Access to the work site will be through the house, across a paved terrace, up a flight of stone steps and along a gravel path. Temporary ground protection sheets will be laid across artificial grass sections of the rear garden, as specified onTree Protection Plan (T.P.P.) at section 4.1. See also paragraph 3.3.8.2.

3.3.2 Intensity, order and nature of construction activity

It is intended to adopt the following operations to achieve the proposed construction:

a) installation of tree root ground protection system. See T.P.P. at Section 4.1.

b) carry out site clearance of surface vegetation S6, S7 and T3, as required.

c) construct a specially designed, membrane lined, lipped container, as the Storage Area for building materials and equipment directly in front of the garden room footprint. This containerized area will be used for mixing cement, use of fuel, paint, preservatives, adhesives and other harmful substances to tree roots. See Storage Area and Mixing Zone marked on T.P.P. at 4.1.

d) carry out construction, including:

i) foundation screw location and insertion under supervision to avoid damage to roots. (refer to 3.3.3 below)

ii) construction of roof to avoid contact with tree branches or stems and to include installation of a safe means of access to enable maintenance of sedum roof . Insert gutter protection mesh to avoid leaf litter blockages.

iii) painting or sealant treatment of wooden structure.

iv) removal of ground protection/fencing.

3.3.3 Specialist Foundation Construction

This technique employs a ground screw pile, 70mm in diameter, inserted to a depth of 870mm below ground level. See ground screw detail at 5.2 Annexe 2. The screws are driven into the ground mechanically but only at such low torque that, should a tree root or obstruction in excess of 25mm in diameter be encountered, the pile will stop and an alternative location found. The flexibility of the pile and deck is such that root morphology can be accommodated without harm to roots over 25mm in diameter. The mini piles can be set at up to 1.2 metre centres and approximately 30 screws are likely to be employed. No cement will be required in the construction of the building. Plywood boards will be used as ground protection during drilling to prevent compaction but only hand held drills are used in this procedure.

3.3.4 Excavating Trenches for Underground Services

There is no proposal to excavate trenches for the above project

a) in the event of the need to trench, all excavations will be carried out beyond the root areas shown on T.P.P. at Section 4.1 with hand tools to a depth of 600mm below ground level. No mechanical tools are to be used and should any root over 25mm in diameter be exposed it must be inspected by the arboricultural expert or left intact and thrust bored beneath.

b) all damaged small diameter roots within any trench must be pared neatly back using a sharp knife, billhook or bypass secateurs.

c) all exposed sides of trenches where roots have been found must be covered in hessian, which in turn must be removed prior to back filling with gravel around services and topsoil above.

d) backfilling must use only topsoil and grit and all air pockets must be heeled out.

e) it will be necessary to top up after settlement has occurred to ensure that surface water runs offs without puddling.

f) if wet concrete or other harmful substances are laid onto or near to any tree root then a waterproof membrane must be laid on the root to form a root barrier.

3.3.5 Preparation for New Soft Landscaping.

Cultivation of any proposed shrub beds or planting within the RPA of any tree will be carried out using hand tools only and all planting works will be carried out by hand and only to a depth of 100mm. Topsoil may be spread or bark chips to meet adjacent ground levels only to a maximum depth of 150mm above existing ground level.

3.3.6 Arboricultural Site Monitoring Record

Robin Hellier is the main point of contact for any tree related issues and should be consulted in the event of:

- amending tree protection installations: ground sheets or fencing
- piling difficulties in driving in ground screws
- trenching revealing large roots over 25mm in diameter
- prior to any tree surgery that is not listed in the tree work schedule. See 5.1 Annexe 1.
- immediately following any damage to a tree by a contractor using machinery or following a storm

3.3.6.1 A form is provided at 5.3 Annexe 3, to provide a dated record of site monitoring, which can be forwarded to LPA upon request.

3.3.6.2 The contractor is required to comply, as follows:

- pay full regard to retained trees at all times
- install tree protection measures as per the TPP, see plan at 4.1
- retain a copy of the AMS on site at all times

- ensure all operatives have read this document including annexes
- conduct a pre-commencement meeting with the tree expert
- regularly check the condition and effectiveness of the tree protection measures
- inform the tree expert in the event of tree related issues that occur during the construction phase

3.3.7 List of contact details for relevant parties

Role	Name	Body	Address	Contact details
Client	Erin Morris	Owner	1 Windsor House 5 Eton Avenue NW3 3EL	
Designer	Steven Davis	London Garden Rooms	South Woodford, London E11 9QP	0208 418 9498
Arboricultural Consultant	Robin Hellier	As above		0208 418 9498
LPA Tree Officer	TBC	The London Borough Camden		

3.3.8 Tree Protection System

3.3.8.1 Construction Exclusion Zone

B.S.5837:2012 requires that an area defined as the root protection area (R.P.A.) and the entire tree canopy is protected during the construction of the new building. This is known as the C.E.Z. and must be in place prior to any construction activities and it is essential that the site supervisor is aware of the need to follow the methods set out in this document to ensure both below and above ground parts of the trees are adequately protected.

3.3.8.2 Tree Protection Plan

The site supervisor must refer to this document (See Section 4.1) to ensure that no pedestrian movements occur over any exposed part of

the RPA of any tree and that all tree protection measures are in place and in accordance with the plan. On this project, the system will comprise ground plates of marine grade plywood capable of supporting the loads brought across tree RPAs.

Ground plates can only be removed to allow approved underground activities within RPAs with supervision from the retained tree expert. Once construction is completed, the plates are to be replaced until the specific areas of no invasive hard surfacing are to be installed. If appropriate all but the finished wearing course might be installed prior to the laying of ground plates.

3.3.8.3 Temporary Ground Protection

This protection takes the form of firmly affixed, robust, plywood boarding laid across the designated areas of the rear garden to the design shown on the TPP at Section 4.1.

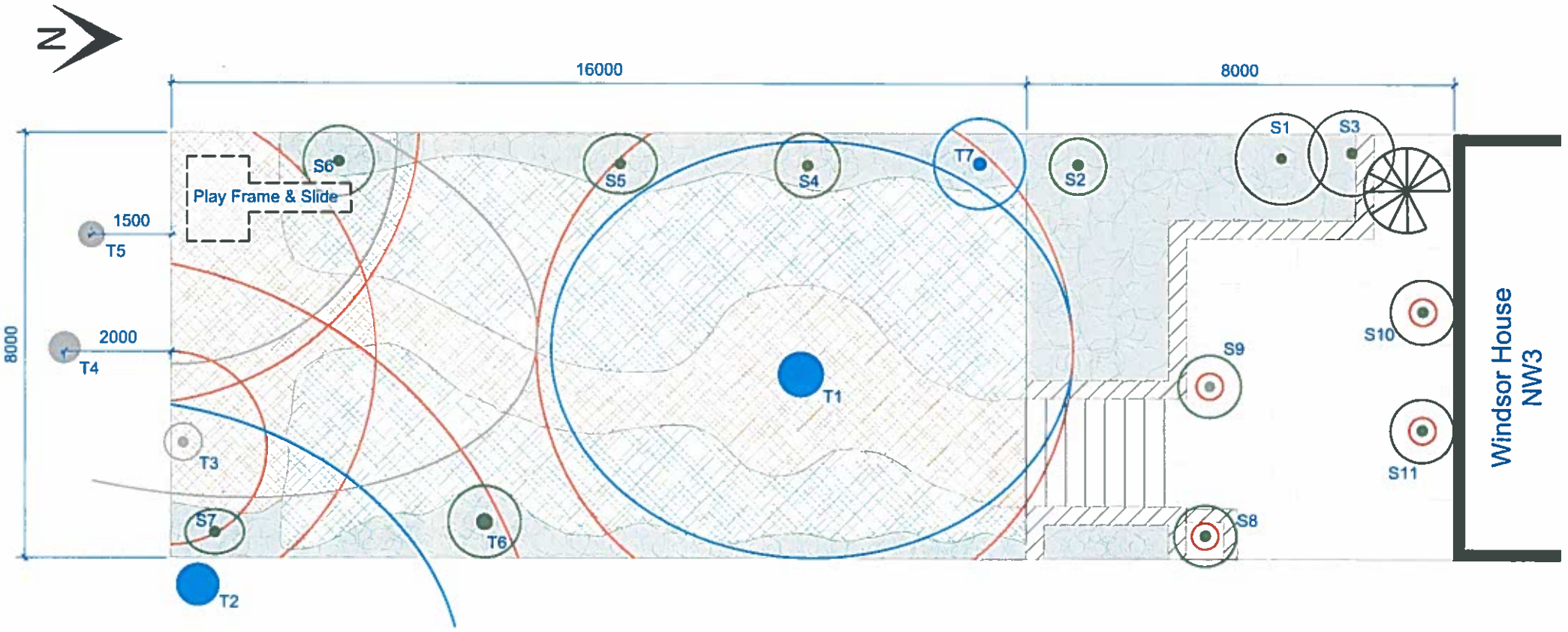
3.3.8.4 Protective fencing

Plywood board panels at 2 metres in height must be fixed around T1, as shown on T.P.P. at Section 4.1.

3.3.8.5 Bonfires

The distance between any bonfire and any part of a tree or its RPA must exceed 10 metres. In this constrained space this requirement will prohibit the setting of fires on site throughout this project.

4.0 TREE CONSTRAINTS PLAN (T.C.P.)

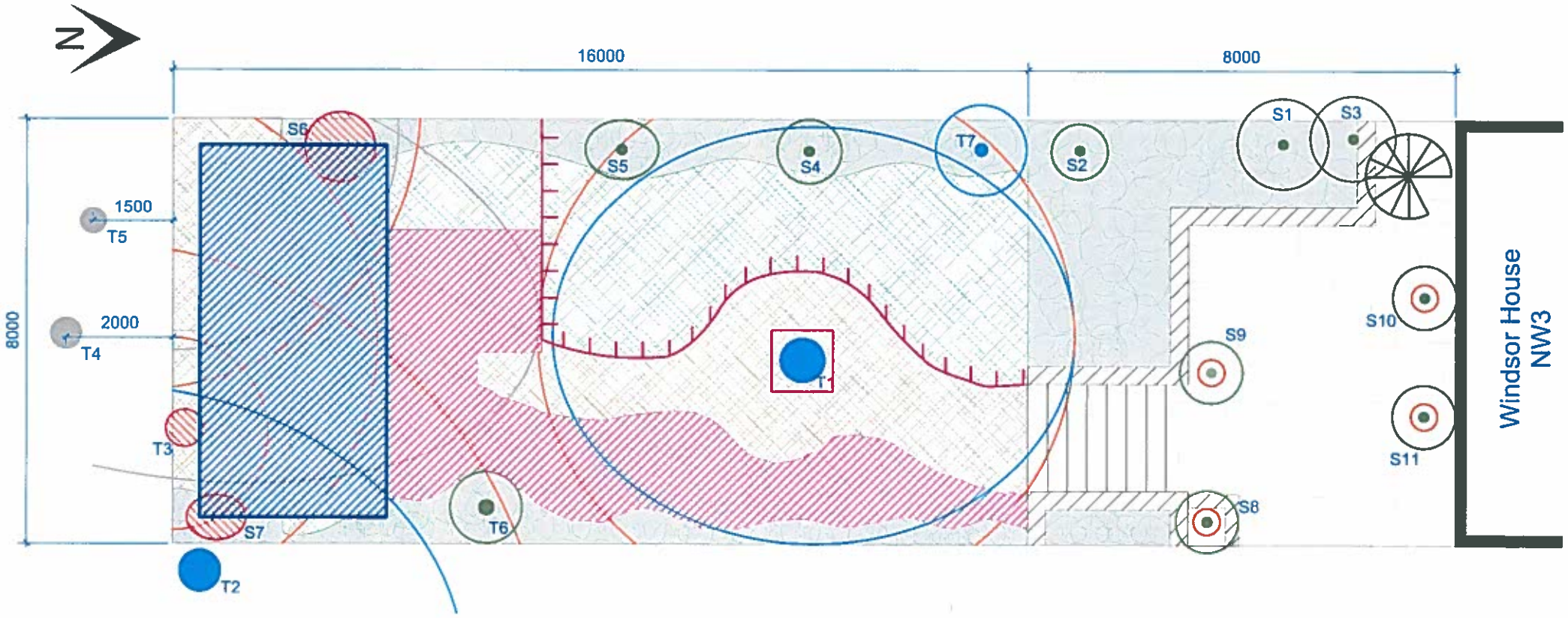


Key

- 'B' Category Tree
- 'C' Category Tree
- Shrubs
- Root Protection Area (R.P.A.)
- Grass Lawn
- Gravel Path
- Paved Patio
- Retaining Wall
- Clay Pots

Title	Tree Constraints Plan - Flat 1, Windsor House
Drawing Number: 5.0	Scale: A4@1:100
Drawn By: London Garden Rooms	

4.1 TREE PROTECTION PLAN (T.P.P.)



Key

- 'B' Category Tree
- 'C' Category Tree
- Shrubs
- Root Protection Area (R.P.A.)
- Grass Lawn
- Gravel Path
- Paved Patio
- Retaining Wall
- Clay Pots
- Tree Removed
- Proposed Garden Room
- Ground Protection
- Protection Fencing
- Plywood Stem Protection

Title: Tree Protection Plan - Flat 1, Windsor House	
Drawing Number: 6.0	Scale: A4@1:100
Drawn By: London Garden Rooms	

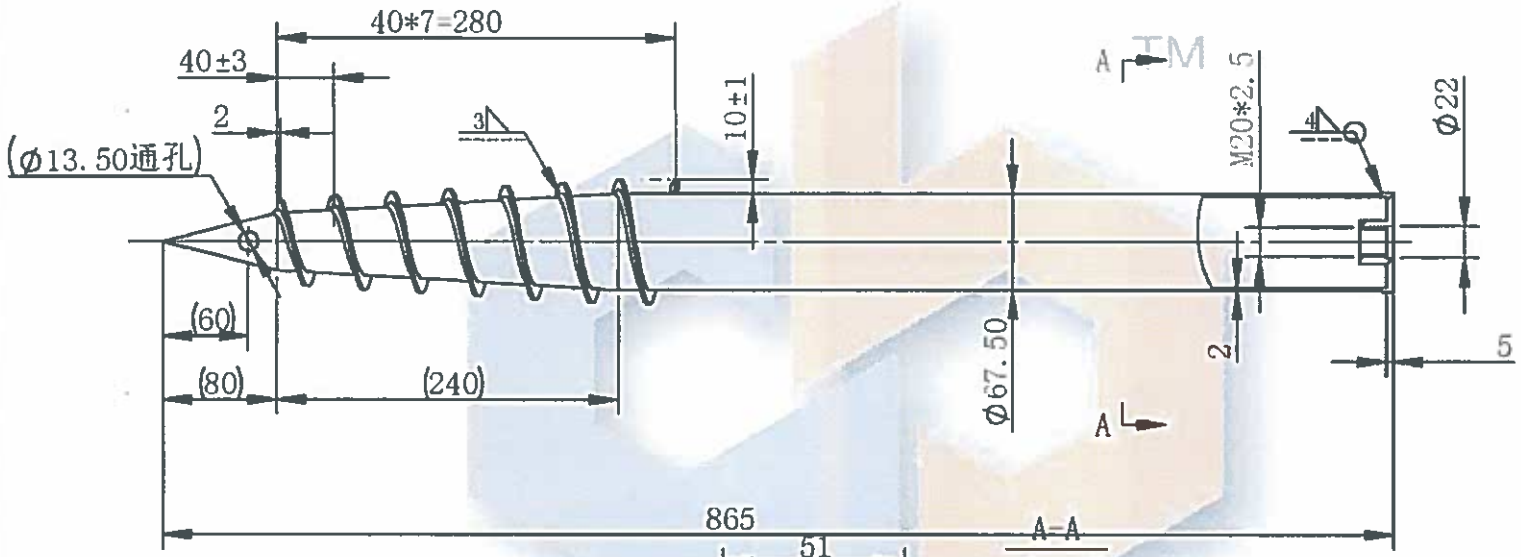
5.0 ANNEXES

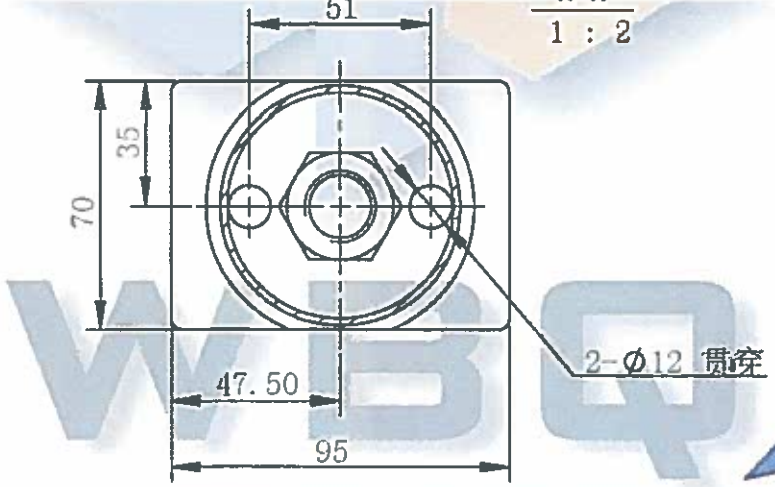
5.1 ANNEXE 1 TREE SURVEY SCHEDULE

Tree Survey at 1 Windsor House, Eton Avenue, London. NW3 3EL

Ref. no.	Species	Height in metres (m)	Stem dia. (mm) @1.5m above ground level	Crown spread (m) into site	Crown apron (m) above ground level.	Age class	Physical condition Vigour	Structural condition	Preliminary management recommendations	Estimated remaining contribution	Category grade	Root protection radius (m)
T1	Robinia	10	460	10	5	Mature	Normal	Recently pruned to high pollard knuckles with 100mm wound diameter	Recent shoots will need repeat cutting back to wound nodes	20+ years	B1	5.5
T2	Beech	11	estimated 550	3	3	Mature	Normal	Twin stemmed from 1.7m above ground level	Crown size recently controlled	20+ years	B1	6.6
T3	Birch	4	30	0.5	1	Young	Stressed Low	Nursery form	Remove to facilitate construction of unit	5 years	C1	2
T4	Sycamore	12	estimated 500	1	4	Mature	Normal	Ivy clad and suppressed	No works	20+ years	C1	6
T5	Sycamore	13	estimated 500	7	5	Mature	Normal	Ivy clad and suppressed	No works	20+ years	C1	6
T6	Prunus spp.	2	4 stems at 50	1	N/A	Early mature	Normal	Multi-stemmed ornamental tree shrub	Thin out selected stems	20+ years	N/A	2
T7	Osmanthus	3	100	2	1.5	Mature	Normal	Inclined stem at boundary	No works	10+ years	B2	2
S1	Viburnum	2	N/A			Mature	Normal	Multi-stemmed shrub	No works	20+ years	N/A	N/A
S2	Camellia	2	N/A			Mature	Normal	Multi-stemmed shrub	No works	20+ years	N/A	N/A
S3	Hazel	2	N/A			Mature	Normal	Multi-stemmed shrub	No works	20+ years	N/A	N/A
S4	Euonymus	1.5	N/A			Young	Normal	Multi-stemmed shrub	No works	20+ years	N/A	N/A
S5	Pittosporum	2	N/A			Mature	Normal	Multi-stemmed shrub	No works	20+ years	N/A	N/A
S6	Euonymus	2.5	N/A			Mature	Normal	Multi-stemmed shrub	Remove	20+ years	N/A	N/A
S7	Euonymus	1	N/A			Young	Normal	Multi-stemmed shrub	Remove	20+ years	N/A	N/A
S8	Olive	2	N/A			Young	Normal	Potted tree shrub	No works	20+ years	N/A	N/A
S9	Olive	2				Young	Normal	Potted tree shrub	No works	20+ years	N/A	N/A
S10	Olive	2				Young	Normal	Potted tree shrub	No works	20+ years	N/A	N/A
S11	Olive	2				Young	Normal	Potted tree shrub	No works	20+ years	N/A	N/A

5.2 ANNEXE 2 GROUNDSCREW DETAILED DIMENSIONS





技术要求：

1、热镀锌平均厚度80μm。
执行标准：DIN EN ISO 1461。
Hot dipped galvanized to DIN EN ISO 1461, average costing 80um。

2、表面要求无明显变形，去焊渣毛刺。
No distortion, no sharp edge。

3、未注公差GB/T19804-C级，孔位置偏差：1mm，孔径差为0.5mm。
Tolerance: standard GB/T19804-C, Hole position±1mm, hole dia. ±0.5mm。

借(通)用件登记
旧底图总号
底图总号
签 字
日 期

标记	处数	更改文件号	签 字	日 期
设计		标准化		
审核		批准		
		日期	2016-11-30	

螺旋地桩		SGP×865-95×70
材 质	Q235B	数 量 1000
图样标记	重量(kg)	比 例
S	3.5	1:5
共 张	第 张	

青岛宝强实业有限公司
QINGDAO WANGBAOQIANG INDUSTRY CO.,LTD

5.3 ANNEXE 3. SITE MONITORING RECORD

Site address	Reason for Visit
	Consultant
	Date of visit

Description	Notes	Remedial action
Ground plates		
Tree works		
Excavations (root damage)		
Above ground damage		