

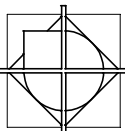
REVISIONS:

LAYERS PLOTTED: 0
DWG FILE NAME: z:\dwg\drawings\1669\ppt-b draft planning mlt-c3-flipped-bungalow-mlt.dwg
DRAWING PREPARED ON CADDTIE CAD. DATA IN A CAD DIF/DWG

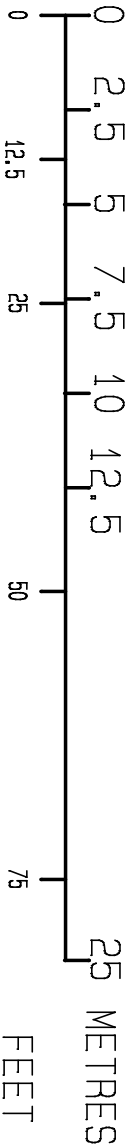
PROJECT
70 MEOPHAM RD, MITCHAM
DRAWING TITLE
PROPOSALS
SECTIONS

DATE AUG 2014
SCALE 1:200 # A2
1:100 # A0
AUTHOR DCB

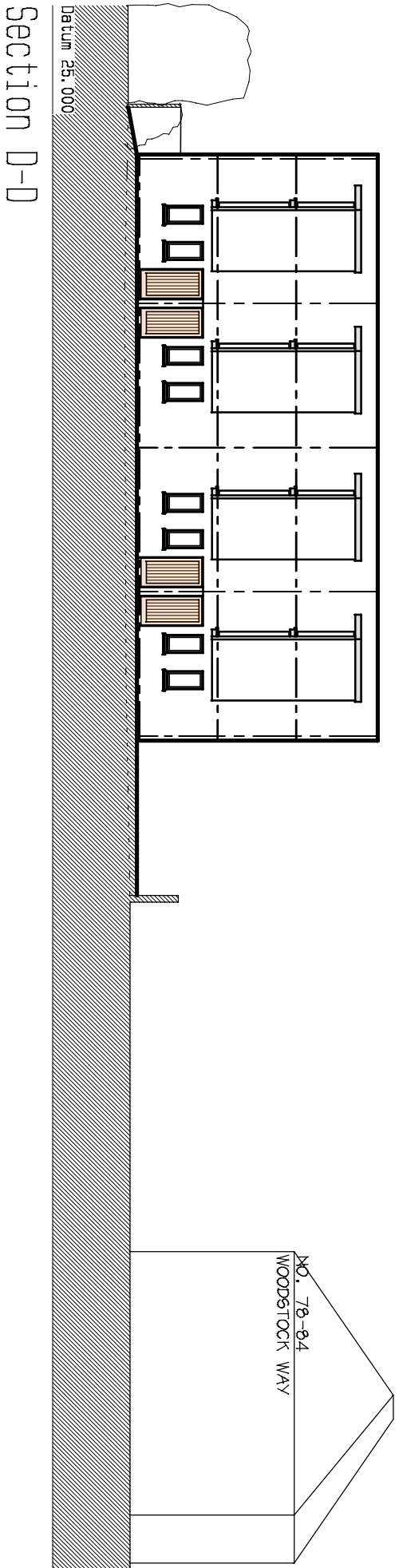
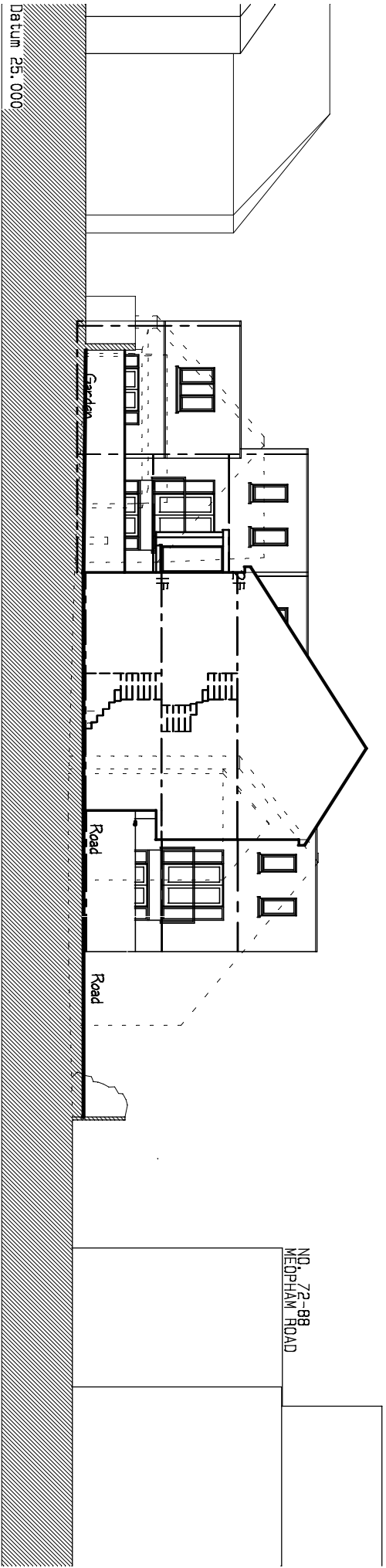
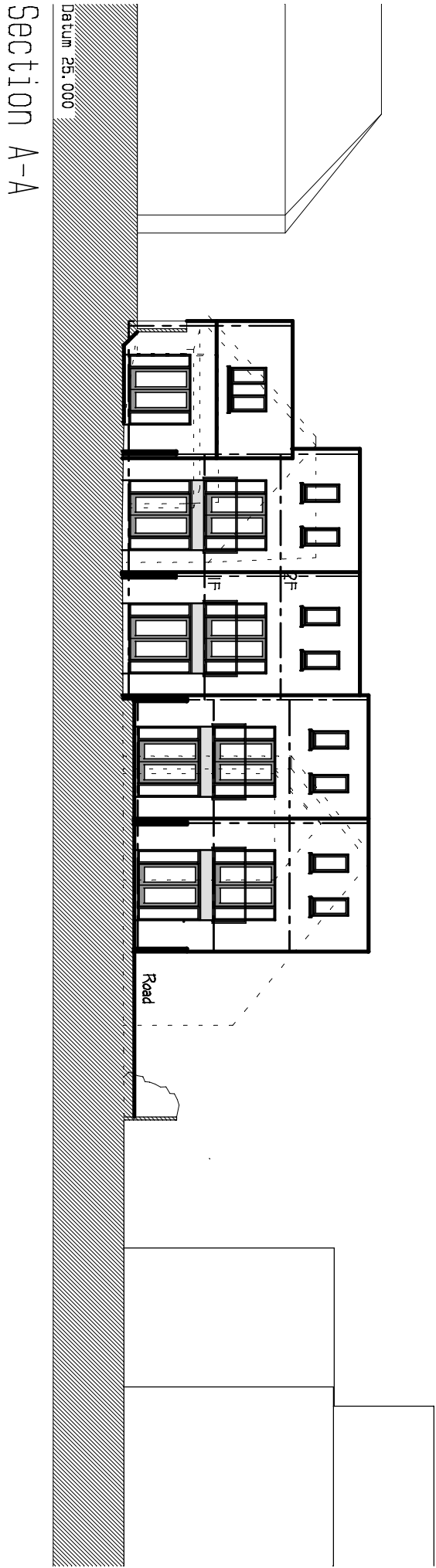
DRAWING NO
1669 6. 8D
CONTRACTOR TO CHECK ALL DIMENSIONS BEFORE FABRICATION
DO NOT SCALE ONLY WORK FROM FIGURED DIMENSIONS
REPORT DISCREPANCIES TO ARCHITECT BEFORE PROCEEDING
© THIS DRAWING IS COPYRIGHT



David Burley ARCHITECTS
CHARTERED ARCHITECTS + INTERIOR DESIGNERS
WATERSIDE STUDIO, THE RETREAT DRIVE, TOPSHAM EX3 0LS
Tel: 01392 876777 Fax: 01392 879456



Schedule of Materials:
Roof: Standing Seam aluminium
Walls: Brick
Bays: Vertical Boarded Cedar
Fascias/Barge: Zinc coated Steel
Windows/Doors: Vertical Oak & Grey PPC Aluminium
Balustrades: Mill finished Aluminium

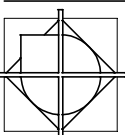


REVISIONS:
LAYERS PLOTTER: 0
DWG FILE NAME: 22:dwg drawings\1669\ppt-to draft\planning\mlt-c3-flipped-bungalow-mlt.dwg
DRAWING PREPARED ON CADDTIE CAD. DATA IN A CAD DIF/DWG

PROJECT
70 MEOPHAM RD, MITCHAM
DRAWING TITLE
PROPOSALS
ELVATIONAL SECTIONS

DATE AUG 2014
SCALE 1:200 # A2
AUTHOR DCB

DRAWING NO
16696.9.3D
CONTRACTOR TO CHECK ALL DIMENSIONS BEFORE FABRICATION
DO NOT SCALE ONLY WORK FROM FIGURED DIMENSIONS
REPORT DISCREPANCIES TO ARCHITECT BEFORE PROCEEDING
© THIS DRAWING IS COPYRIGHT



David Burley ARCHITECTS
CHARTERED ARCHITECTS & INTERIOR DESIGNERS
WATERSIDE STUDIO, THE RETREAT DRIVE, TOPSHAM EX3 0LS
Tel: 01392 876777 Fax: 01392 879456

EcoLogic Consultant Ecologists LLP

10 Elizabeth Avenue

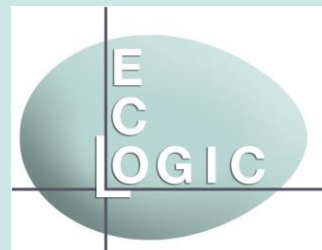
Stoke Hill

Exeter

EX4 7EL

andrew@ecologic-consultants.co.uk

www.ecologic-consultants.co.uk



**Memo: 68 & 70 Meopham Road, Mitcham
Greater London, CR4 1BJ**

Project Number: 150303 rev00

Sent by: Email

Date: 13th January 2016

Ecological Mitigation & Enhancement Plan

Hedge

Status: A newly planted hedgerow along southwestern boundary.

Aim: To provide a dense vegetation screen.

Objectives: Plant a native hedgerow;
To undertake appropriate aftercare to establish hedgerow;
Continue ongoing management to maintain dense hedgerow growth up to 2.5m.

Spacing	Double line spacing 30cm apart, with plants planted alternately. Pot grown shrubs should be planted at 4 plants per metre.		
Size of Stock	Pot grown plants - 600 to 900 mm. Ideally two years old (1 year within a nursery +1 year grown on outside).		
Mulch	Mulch to depth of 75 mm, to suppress 'weeds' & to provide slow release of nutrients.		
Method of Planting	Individual pit planting		
Species	Holly	<i>Ilex aquifolium</i>	40%
	Wild privet	<i>Ligustrum vulgare</i>	20%
	Hazel	<i>Corylus avellana</i>	20%
	Field Maple	<i>Acer campestre</i>	20%

Planting Specification for New Hedge

Management

During the first 3 years, the newly planted hedgerow should be trimmed lightly, in order to establish and encourage dense vegetation growth.

During this initial 3 year period, the plants should be annually inspected with any failed specimens replaced during the following autumn or spring.

Continued ongoing management of the hedgerow will be undertaken to encourage a dense vegetation structure, which will in turn provide habitat for invertebrates, birds and bats. Trimming should be undertaken once every three years, with the hedgerow allowed to attain a height at or above 2.5m.

Trimming should be undertaken outside of the bird nesting season (i.e. trimming should be undertaken from September to February inclusive).

Fencing

Status: A new fence line to be incorporated along southeast and southwestern boundary.

Aim: To provide visual screen and site security.

Objectives: Install fence which allows easy of movement for invertebrates, small mammals (hedgehog), birds and amphibians.

Fence Specification

A double rowed and staggered fence including no ground obstruction (see detail below).

Rows of boarding are to be separated by a minimum distance of 150mm.

Fence to be 8 foot (2.4m) in height.



Inbuilt Bat & Bird Roosting/Nesting Provisions

Status: Install inbuilt bat roosting and bird nesting provisions within the new dwellings.

Aim: To provide bat roosting and bird nesting opportunities.

Objectives: Install bat roosting and bird nesting provisions in suitable locations and arrangements.

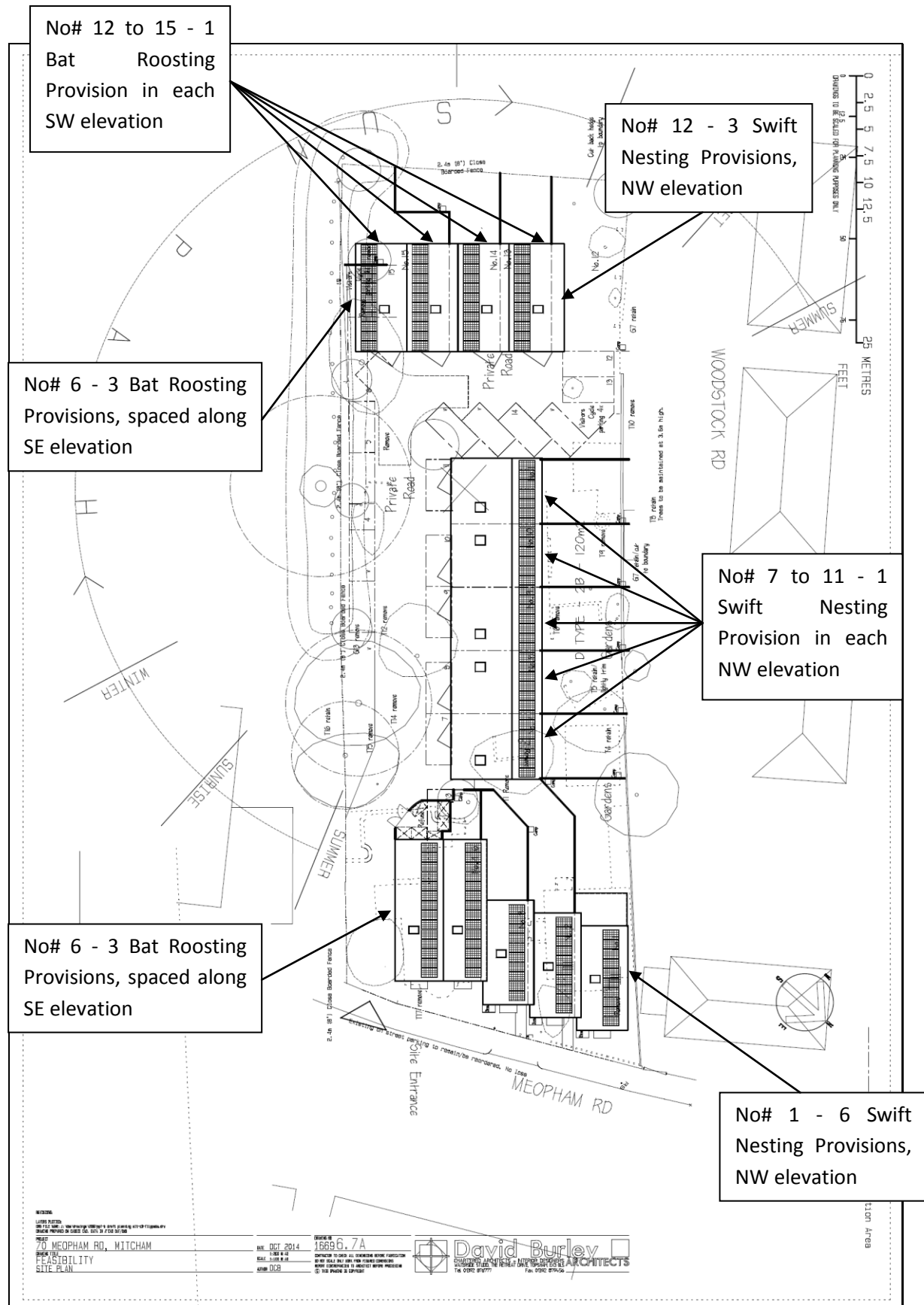
Specifications of provisions to be confirmed.

Development to include:

- 14 Swift nesting compartments; and,
- 10 bat roosting compartments.

See detail below.

Inbuilt Bat Roosting & Bird Nesting Provision Locations



Arboricultural Impact Assessment & Method Statement



For planning purposes at

**68-70 Meopham Road
Mitcham
London
CR4 1BJ**



Dated
15th October 2015



PDF readers select *page-width* for detail & *page-view* for scrolling

Arboricultural Report to BS 5837: 2012 for: Venture Park Limited

Crown Ref: 09185

Site: 68-70 Meopham Road, Mitcham

Author: Ivan Button

Date: 15th October 2015

Contents

1.	Introduction	3
1.1.	Instruction	3
1.2.	Scope and Purpose of the Report	3
1.3.	References	3
1.4.	Drawings	3
2.	Arboricultural Impact Assessment	4
2.1.	Overview	4
2.2.	Tree Removal	4
2.3.	Mitigation Planting	5
2.4.	Impact on Tree Canopies	5
2.5.	Impact on Tree Roots	5
2.6.	Demolition Activities	6
2.7.	Hazardous Materials	6
2.8.	Cabins and Site Facilities	6
2.9.	Boundary Treatments	6
2.10.	Impact of Retained Trees on the Development	6
3.	Method Statement	7
	Section A: Introduction and Overview	7
3.1.	Definition of Terms	7
3.2.	Tree Protection Barriers - Overview	7
3.3.	Planning Status	8
3.4.	Overview of Protection Measures	8
3.5.	Timing of Operations	9
3.6.	Confirming Detailed Proposals (Reserved Matters)	9
	Section B: Restrictions on Activities – Specific Zones	10
3.7.	Construction Exclusion Zones	10
3.8.	Restricted Activity Zone A	10
3.9.	Restricted Activity Zone B	11
	Section C: Restrictions on Activities – Throughout the Site	12
3.10.	Installation of Foundations	12
3.11.	Canopy Protection	12
3.12.	Site Hoarding	12
3.13.	Fence Posts or Decking Posts	12
3.14.	Demolition and Initial Ground Works	13
3.15.	Underground Services	13
3.16.	Lighting, Bollards, CCTV and associated Cables	13
3.17.	Use of Heavy Plant	13
3.18.	Scaffolding	13
3.19.	Siting of Cabins and Storage of Materials	13
3.20.	Pedestrian Paving	14
3.21.	Hazardous Materials	14
	Section D: Post-Construction Phase	15
3.22.	Removal of Tree Protection Barriers	15
3.23.	Landscaping	15
3.24.	Tree Planting	15
4.	Site Inspection	16
4.1.	Inspection Schedule	16
4.2.	The Appointed Arborist	16
5.	Tree Works Schedule	17
5.1.	Tree Works Specification	17
6.	Tree Protection Barriers	18
6.2.	The In-Ground System	18
6.3.	The Back-Stay System	18
6.4.	The Barrier-Mesh System	19
6.5.	Notices	19
7.	Ground Protection Measures	20
8.	New Surfaces	21
8.1.	No-Dig Driveway Installation	21
8.2.	Pedestrian Surfaces	24
9.	Planting Scheme	25
9.1.	Tree Planting Schedule	25
9.2.	Tree Planting Specification	25
9.3.	Aftercare	26
10.	Signature	27
	Appendix 1: BS 5837: 2012 – Guidance Notes	28
	Appendix 2: Explanation of Tree Data & Glossary	30
	Appendix 3: Survey Methodology	34
	Appendix 4: Author's Qualifications	34
	Appendix 5: Further Information	35
	Appendix 6: Tree Data Schedule and Site Plan(s)	36



1. Introduction

1.1. Instruction

- 1.1.1. We are instructed by Sebastian Abris of Venture Park Limited to assess the likely impact of development proposals and produce a Method Statement detailing how trees shall be protected from proposed construction activity at 68-70 Meopham Road. This report should be read in conjunction with our report dated the 2nd September 2014 which presents the results of our tree survey to British Standard 5837 (2012).

1.2. Scope and Purpose of the Report

- 1.2.1. This report is designed to accompany a planning application for development proposals at the above site. Its purpose is to assist and inform the planning process. It is produced according to the guidance and recommendations within BS 5837: 2012 - *Trees in Relation to Design, Demolition and Construction*.
- 1.2.2. The Method Statement should be viewed as a *Heads of Terms* Method Statement which specifies the general principles to be adopted during construction and demolition. However, specific construction activities proposed within Root Protection Areas may need to be agreed in more detail if requested by the local authority at the reserved matters stage.

1.3. References

- 1.3.1. We have liaised with David Burley Architects throughout the writing of this report in order to attain an adequate understanding of the project to enable us to carry out an accurate assessment of the proposals and to specify suitable tree protection measures.
- 1.3.2. This report supersedes our earlier report dated 27th August 2015 which assessed slightly different proposals.

1.4. Drawings

- 1.4.1. We have been supplied with a measured plan of the site with tree positions already plotted. Where applicable, additional trees have been plotted according to measurements taken on site.
- 1.4.2. The *Tree Constraints Plan* shows the existing layout. For each tree the stem location is indicated and scaled according to its diameter, the canopy is indicated according to measurements taken along the four cardinal points of the compass. Root protection areas (RPAs) are indicated which are calculated according to the guidelines within BS 5837 (2012).
- 1.4.3. Where appropriate, the shapes of the RPAs have been amended to reflect actual site conditions or where trees have been heavily pruned. The 'original' RPAs are indicated as a dashed line whereas the amended RPAs are indicated as a solid line.
- 1.4.4. The *Impact Assessment Plan* indicates the tree constraints with the proposals overlaid. Where applicable, this plan shows where works are proposed in Root Protection Areas and which trees are to be pruned or removed. This plan accompanies the Impact Assessment which is to be found in Section 2.
- 1.4.5. The *Tree Protection Plan* shows the protection measures that are to be installed during the construction phase. This plan accompanies the Method Statement which is to be found in Section 3.



2. Arboricultural Impact Assessment

2.1. Overview

2.1.1. It is proposed to demolish the existing buildings and construct new residential apartments as indicated on the plans in Appendix 6. The existing layout is indicated in blue, the footprint of the proposed layout is indicated in pale green.

2.1.1. The table below summarises the potential impact on trees due to various activities.

Activity	Trees Potentially Affected
Tree Removal: Retention Category A	None
Tree Removal: Retention Category B	None
Tree Removal: Retention Category C	T1, T2, T9, T11, T12, G13, T14, T15 and T17
Tree Removal: Retention Category U	T6, T10
Tree Pruning	G7, T4, T5
RPA: Foundations	None
RPA: New Surface	T4, T5, G7, T8
RPA: Underground Services	To be confirmed
RPA: Change of Ground Levels	None
RPA: Soil Compaction	T4, T5, G7, T8 (preventable by installing tree protection measures)

2.1.2. Other potentially damaging activities often associated with construction sites include demolition or the careless use of plant machinery, hazardous materials, or fires.

2.1.3. All of the above potential impacts are considered in detail throughout this section. Section 3 specifies the measures proposed to minimise all possible potential risks of damage to the retained trees.

2.2. Tree Removal

2.2.1. All trees to be removed are indicated on the Tree Removal Plan and are listed below:

2.2.2. **Retention Category A:** It is proposed to retain all Retention Category A trees.

2.2.3. **Retention Category B:** It is proposed to retain all Retention Category B trees.

2.2.4. **Retention Category C:** It is proposed to remove the following Retention Category C trees: T1, T2, T9, T11, T12, G13, T14, T15 and T17.

2.2.5. These are all relatively small trees. With the exception of T17, all are located within a rear garden and are not visible from public vantage points. Consequently they are considered to have a low amenity value. T17 is a small privet in the front garden which is also considered to have a low amenity value. The removal of these trees shall not have a significant impact on the visual amenity of the locality and they are not considered to be a material planning consideration.

2.2.6. **Retention Category U:** It is proposed to remove the following Retention Category U trees: T6 and T10.

2.2.7. Trees within this category are in such poor condition that they should be removed regardless of development proposals. Consequently the removal of Category U trees is not considered to be a direct impact of the development.



2.3. Mitigation Planting

- 2.3.1. It is proposed to plant two heavy-standard sized trees in the locations shown on the Proposed Planting Plan. A blue atlas cedar and a purple beech are proposed. These are both large growing species and are considered adequate mitigation given the size and low amenity value of the trees to be removed. The site does offer ample opportunity to plant several smaller species as part of a post-development landscaping scheme.
- 2.3.2. The planting scheme at Section 9 provides more details.

2.4. Impact on Tree Canopies

- 2.4.1. It is proposed to prune back the canopies of the cypresses in G7 back to the boundary where they are close to the flank wall of the rear-most proposed building (see the Impact Assessment Plan).
- 2.4.2. It is also proposed to crown lift the canopies of T4 and T5 to a height of 3.5m above ground level. This shall be sufficient to enable all anticipated construction traffic to pass beneath without damaging any branches.

2.5. Impact on Tree Roots

2.5.1. Rooting Habits:

- 2.5.2. The roots of T3 and T16 are not likely to proliferate in the site due to the presence of boundary wall foundations and garage foundations within the site.
- 2.5.3. The RPA of T8 has also been reduced because the canopy of this tree has also been heavily reduced so will not require the same rooting volume as any calculation based on stem diameter would suggest. The RPA indicated with a dashed line on the accompanying plans is considered to be ample.

2.5.4. Foundations:

- 2.5.5. No foundations are proposed within the Root Protection Area of any retained tree. The foundations for the building closest to G7 shall be 3.3m from this hedge. RPA calculations do not really apply to hedges because, unlike other trees, they are artificially maintained at a small size. Hence the relationship between the stem diameter, the foliage and the root system is not the same.

2.5.6. New Surfaces:

- 2.5.7. The Impact Assessment Plan indicates where it is proposed to install a new hard surface over the Root Protection Areas of T4, T5, G7 and T8. T5 are the trees potentially most affected as the new surface shall occupy approximately one third of the Root Protection Area.
- 2.5.8. Traditionally installed hard surfaces can result in the severance of roots (due to excavation) as well as impoverishment of the rooting environment (due to soil compaction, rainfall interception and anaerobic conditions beneath).
- 2.5.9. Various systems are available which minimise the potential impact of hard surfacing over tree roots. Because quite a large portion of the Root Protection Areas shall be affected, it is proposed to utilise the Arborcraft System. This is considered to be the superior system due to its very light-weight construction, outstanding load spreading properties and because it enables full gaseous exchange and rainwater penetration. So long as this system is installed with no excavation, there will be no damage to tree roots and no impoverishment of the rooting system. This system is specified in Sections 3.9 and 7.



2.5.10. **Underground Services:**

2.5.11. Due to the potentially major impact of excavating trenches within Root Protection Areas, the locations of all underground services should be approved by the local authority after consultation with an appointed arborist to assess the potential impact on trees.

2.5.12. **Changes in Ground Levels:**

2.5.13. I understand that no changes to ground levels are proposed over Root Protection Areas.

2.5.14. **Soil Compaction:**

2.5.15. Tree protection measures specified are specified in Section 3. These include measures to minimise soil compaction. They should be maintained throughout the project to ensure minimal impact on tree roots due to construction activity.

2.6. Demolition Activities

2.6.1. There are no structures that require demolition close to trees.

2.7. Hazardous Materials

2.7.1. All hazardous materials (including cement and petrochemical products) will need to be controlled according to COSHH regulations in order to ensure there is no detrimental impact on tree health. Provision shall need to be made to ensure that cement and cement run-off are contained outside of all Root Protection Areas.

2.8. Cabins and Site Facilities

2.8.1. There is ample room for the siting of cabins and storage of materials / spoil during the construction phase without impacting on trees.

2.9. Boundary Treatments

2.9.1. I am not aware of any changes are proposed to the existing boundary features that will impact upon any trees.

2.10. Impact of Retained Trees on the Development

2.10.1. Some occasional trimming of the canopy of T5 may be required in the future to maintain an appropriate distance from the proposed buildings.

2.10.2. If the canopies of G7 regenerate after being pruned back to the boundary, then occasional future trimming shall also be required.

2.10.3. All other retained trees are located at sufficient distances from any proposed buildings and shall have ample room for future growth.



3. Method Statement


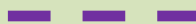
Section A: Introduction and Overview

3.1. Definition of Terms

- 3.1.1. Some terms used within the Arboricultural Method Statement have very specific meanings. These are defined below:
- 3.1.2. **Root Protection Area (RPA).** This is a theoretical area of ground around a tree where the roots are likely to proliferate. Ground disturbance in this area should be minimised in order to avoid significant impact on tree health. RPAs are indicated on all plans accompanying this report as a pink line.
- 3.1.3. **Construction Exclusion Zone (CEZ).** These zones are created to protect roots and canopies from inadvertent damage by construction activity – see Section 3.7. -*Construction Exclusion Zones*. They are usually fenced off by protective barriers throughout the entire construction phase. No works are permitted in these zones other than minor landscaping works which do not require a change in ground level. Where practicable the entire Root Protection Area and the area beneath the tree canopy shall be treated as a Construction Exclusion Zone. These zones are hatched purple on the Tree Protection Plan.
- 3.1.4. **Restricted Activity Zone (RAZ).** It is not always possible to create a Construction Exclusion Zone over the entire RPA. This is because access may be required or some works may be proposed within the RPA. In such circumstances a Restricted Activity Zone is created where limitations are placed on construction activity. Ground protection measures may be specified or the Restricted Activity Zone may be fenced off throughout part of the construction phase. See the legend on the Tree Protection Plan to identify these zones.

3.2. Tree Protection Barriers - Overview

- 3.2.1. The Tree Protection Plan indicates the location of all proposed tree protection barriers according to the following legend and overview:

Symbol on Tree Protection Plan	Barrier type See Section 6	Location
	In-Ground System or Back-Stay System	Around the Construction Exclusion Zones, close to where construction activity is proposed. As indicated on the Tree Protection Plan.
	Back-Stay System	N/A

- 3.2.2. The barriers shall be installed prior to the commencement of any construction activity including soil stripping and delivery of materials. A detailed specification of the barriers can be found in Section 6.
- 3.2.3. The tree protection plan also indicates where ground protection measures shall be installed as specified in sections 3.8 onwards (Restricted Activity Zones) and Section 7–*Ground Protection Measures*.



3.3. Planning Status

- 3.3.1. Tree protection measures specified within this report should be agreed with the local authority so that they may be conditioned upon planning consent.
- 3.3.2. The site manager must be familiar with all aspects of this Method Statement and should liaise with the author of this report for clarification, or regarding any unforeseen issues where trees may be impacted upon.
- 3.3.3. A copy of this Method Statement shall be available on-site at all times. All personnel working on the site shall be made aware of any sections appertaining to their work. This includes short term contractors and persons responsible for deliveries and installation of services.

3.4. Overview of Protection Measures

- 3.4.1. Below is a list of potential arboricultural impacts and a summary of the proposed protection measures:

Reference	Comments	Potential Impact	Protection measures
T4, T5, G7, T8	Access is required over the Root Protection Area.	Compaction and contamination adjacent to proposed works.	Restricted Zone A created and ground protection measures to be installed before commencement, and maintained throughout the project. Construction exclusion zone to be created over remainder of Root Protection Area. See Section 3.8 for all restrictions that apply.
T4, T5, G7, T8	New hard surface proposed over Root Protection Area.	Root severance. Soil compaction. Impoverishment of the rooting environment	Restricted Zone Created and either fenced off or ground protection measures installed to prevent soil compaction. No-Dig OR Minimum-Dig method to be adopted to prevent root severance. Arborcraft system to be installed to ensure maximum load spreading and to enable full gaseous exchange and rainwater penetration. See sections 3.9 and 7.
G7	Canopy is close to proposed construction activity.	Damage to overhanging branches.	Foliage to be pruned back to the boundary.
T4, T5	Traffic shall pass beneath the canopy.	Damage to overhanging branches.	Canopy to be lifted to a height of 3.5m.
All other retained trees	No significant works are proposed in Root Protection Areas.	Compaction and contamination from general construction activity.	Protective fencing installed as specified in Section 6 and Construction Exclusion Zone created where appropriate. No works permitted in Exclusion Zone.

- 3.4.2. The above measures are described in more detail throughout the remainder of this section.



3.5. Timing of Operations

3.5.1. Activity within the site shall be phased according to the following chronology:

Order	Phase	Activity
1st.	Pre-Construction Phase	Detailed design submission for approval (see Section 3.6 below). Discharge of any planning conditions relating to trees.
2nd.		Undertake all specified tree removal and pruning (see Section 5 -Tree Works Schedule).
3rd.		Install the tree protection barriers (see Tree Protection Plan and Section 6 -Tree Protection Barriers).
4th.		Install ground protection measures (see Tree Protection Plan and Section 7 -Ground Protection Measures)
Protection measures confirmed acceptable by the local authority		
5th.	Construction Phase	Demolish existing structures and remove existing surfaces where applicable.
6th.		Install new buildings, hard surfaces and services taking into account restricted activities as specified in Sections 3.7 onwards
7th.	Post-Construction Phase	Remove protective barriers (fencing and ground protection measures as applicable).
8th.		Undertake restricted landscaping operations within Root Protection Areas, including boundary treatments, pedestrian surfaces, decking and any proposed tree planting.

3.6. Confirming Detailed Proposals (Reserved Matters)

3.6.1. This Method Statement is a *Heads of Terms* method statement. This means that it specifies the general principles to be adopted during proposed development works. Often additional input is required from engineers to confirm the exact locations of services or technical specifications which are beyond the scope of an arborist. This is usually provided at the reserved matters stage via planning conditions. The table below highlights where such confirmation is required.

Nature of Activity	Areas Potentially Affected	To be Confirmed
Services	Construction Exclusion Zones and Restricted Activity Zones	Exact location of all underground services and trenches. Location of any proposed soak-aways. Method of installation where services pass through Root Protection Areas.
Hard surface	Near T4, T5, G7 and T8	Arboraft system or similar to be agreed and approved with the local authority tree officer. Exact specification of surface to be agreed.
Boundary Treatments	Plot boundaries	Nature of new boundary features. Method of installation of walls and fences over Root Protection Areas where applicable.
Landscaping	Construction Exclusion Zones	Any specific landscaping proposals requiring approved by the local authority but not considered within this report.

3.6.2. The limitations specified within this report need to be considered in detail by building and/or demolition contractors. Any conflicts should be raised at an early stage so that issues may be resolved and agreed with the local authority. This may require the production of a revised Method Statement.



Section B: Restrictions on Activities – Specific Zones

3.7. Construction Exclusion Zones

3.7.1. Within Construction Exclusion Zones (shaded purple on the Tree Protection Plan) the following restrictions shall apply:

- Fencing shall be erected and maintained throughout the entire project as indicated on the Tree Protection Plan and specified in Section 6 -Tree Protection Barriers.
- No construction activity whatsoever shall occur.
- No tree works, other than those specified in this report shall be undertaken.
- No alterations of ground levels or conditions.
- No chemicals or cement washings permitted.
- No excavation whatsoever.
- No temporary structures.
- No spoil shall be stored.
- No fires shall be permitted.
- All hazardous materials (including non-essential cement products) shall be forbidden.

3.7.2. Any hard surfaces that require removal shall be removed prior to the installation of the protective fencing or following all other major construction activity and the removal of the fencing. Surfaces shall be removed using hand tools or mechanical excavators operating from outside the Construction Exclusion Zone and marshalled by the appointed arborist.

3.8. Restricted Activity Zone A

3.8.1. Within these zones (indicated on the Tree Protection Plan) access will be required to facilitate construction. The following restrictions shall apply:

- No permanent or temporary structures shall be erected without written approval from the local authority.
- Removal of existing structures such as, walls, steps and hard surfaces shall be undertaken using hand tools or a mechanical excavator operating from outside the Restricted Activity Zone and carefully marshalled by an appointed arborist.
- Ground protection measures shall be installed as specified in Section 7 -Ground Protection Measures. These shall remain in place throughout the entire construction phase. *Note: where existing paving is retained and only pedestrian activity is proposed, no additional ground protection measures will be required*
- Vehicles or plant machinery in excess of 2 tonnes shall not be permitted in this area.
- Existing ground levels shall be retained undisturbed, except where batter slopes are installed alongside new surfaces or structures. Where applicable, batter slopes shall be installed using granular topsoil (not rich in clay) which shall slope down away from the edge of the structure and shall not exceed 200mm in depth.
- No excavation shall occur in this zone without consulting the appointed arborist and obtaining approval from the local authority.
- Storage of materials shall be limited to that which is required for the task in hand. Heavy materials that require storage for more than two days shall be stored outside the Restricted Zone.
- No spoil shall be stored.
- No fires shall be permitted.
- All hazardous materials (including non-essential cement products) shall be forbidden.



3.9. Restricted Activity Zone B

3.9.1. Within this zone (indicated on the Tree Protection Plan) it is proposed to install a new surface.

3.9.2. The following restrictions shall apply:

- No other building works shall be permitted.
- Ground protection measures shall be installed as specified in Section 7 -*Ground Protection Measures*, and shall remain in place until the new surface is installed. (Any existing hard surfacing may be retained in place of ground protection measures.)
- Removal of existing structures such as, walls, steps and hard surfaces shall be undertaken using hand tools or a mechanical excavator operating from outside the Restricted Activity Zone and carefully marshalled by an appointed arborist.
- The new surface shall be installed according to the *No-Dig* method as specified in Section 8 -*Surfaces*. Subject to approval from the local authority tree officer the Arborcraft cellular confinement system is to be installed which is also specified in Section 8.
- No vehicles or machinery shall pass over this area prior to the installation of the new surface unless ground protection measures are in place.
- No spoil shall be stored.
- Storage of materials shall be limited to that which is required for the task in hand. Heavy materials that require storage for more than two days shall be stored outside the Restricted Zone.
- No fires shall be permitted.
- All hazardous materials (including non-essential cement products) shall be forbidden.



Section C: Restrictions on Activities – Throughout the Site

3.10. Installation of Foundations

- 3.10.1. All foundations are to be excavated outside of Root Protection Areas (or on the very periphery) so their method of installation is of no arboricultural concern.

3.11. Canopy Protection

- 3.11.1. In order to protect tree canopies the following restrictions shall apply throughout the site:

- No machinery in excess of 3m shall pass beneath the canopy of any tree without being carefully marshalled in order to ensure that no branches are damaged.
- If materials require installation or delivery beneath tree canopies, this shall be done without the use of overhead cranes.
- If materials are to be installed or delivered close to tree canopies (but not beneath them) and a crane is required, they shall be carefully marshalled in order to ensure that branches are not accidentally damaged.

3.12. Site Hoarding

- 3.12.1. If site hoarding shall be installed over the Root Protection Area of any tree, the following restrictions shall apply:

- Ground levels shall be maintained as existing.
- Post holes shall not exceed 300mm x 300mm.
- No post hole shall be excavated within 1.5m of any tree stem.
- Post holes shall be excavated using hand tools or by a post-hole auger attached to plant machinery sited outside the Root Protection Area(s).
- Roots in excess of 25mm shall be retained wherever possible.
- Roots in excess of 10mm shall be pruned with sharp secateurs.
- Pruning shall be minimal and only undertaken where absolutely necessary to facilitate the site hoarding. It shall be undertaken by a reputable tree surgeon working to BS 3998 (2010).
- Cement products shall be mixed away from Root Protection Areas (see Section [3.21](#) - Hazardous Materials).

- 3.12.2. Site hoarding may be installed in place of the specified tree protection measures subject to the approval of the local authority with regard to its location and specification.

3.13. Fence Posts or Decking Posts

- 3.13.1. If permanent fencing or decking is to be installed within Root Protection Areas, the following restrictions shall apply:

- All post holes shall be excavated by hand and kept as narrow as possible (maximum diameter 300mm).
- Exploratory post holes shall be dug before committing to post / panel positions. If any roots in excess of 25mm are encountered they are to remain intact and the post hole shall be relocated slightly. The fencing system must permit such flexibility (i.e. where fixed panel widths are used, all post holes must be excavated before committing to the final location).
- Any roots in excess of 10mm which are severed shall be neatly pruned back with secateurs. This will encourage healing and reduce the likelihood of infection.



3.13.2. Walls shall be avoided over Root Protection Areas unless their foundations may be spanned over roots using a beam system.

3.13.3. Hedges may be planted within Root Protection Areas using hand tools to minimise excavation.

3.14. Demolition and Initial Ground Works

3.14.1. No demolition, removal of surfaces, or soil stripping shall commence until the protective fencing and ground protection measures are installed to the satisfaction of the local authority.

3.15. Underground Services

3.15.1. No underground services shall pass through any part of the *Construction Exclusion Zones* or *Restricted Activity Zones* unless done so in a manner detailed in a specific Method Statement and approved by the local authority.

3.16. Lighting, Bollards, CCTV and associated Cables

3.16.1. If any of the above are to be installed close to tree canopies or within Root Protection Areas of retained trees; installation methods shall be detailed in a specific Method Statement and approved by the local authority. Consideration should be given to the following:

- Pruning of branches to enable sufficient clearance for light and views. Branches should be removed to the *branch collar* as per British Standard 3998 (2010).
- Post holes must be excavated by hand or using an appropriate sized auger. No other form of mechanical excavation may be used.
- Cables should be routed in a direction directly away from the tree. It will not be acceptable to excavate a trench across any Root Protection Areas.

3.17. Use of Heavy Plant

3.17.1. All machinery operatives are to be made aware of any *Construction Exclusion Zones* and *Restricted Activity Zones* that apply to this site (see the Tree Protection Plan and Section 3.7 onwards).

3.17.2. All machinery operatives are to respect these zones and ensure that no damage occurs to trees due to the careless use of machinery.

3.18. Scaffolding

3.18.1. If scaffolding is required in areas containing ground protection measures, the protective boards shall need to remain in-situ and be strengthened and stabilised to bear the weight of scaffold poles.

3.18.2. Prior to the installation of any scaffolding within 0.5m of any tree branches, the appointed arborist shall be consulted to specify any pruning works that may be required.

3.19. Siting of Cabins and Storage of Materials

3.19.1. Cabins and heavy building materials may be located or stored anywhere outside of *Construction Exclusion Zones* and *Restricted Activity Zones*.

3.19.2. Any proposal to install cabins or materials within these zones shall be agreed in writing with the local authority prior to installation.

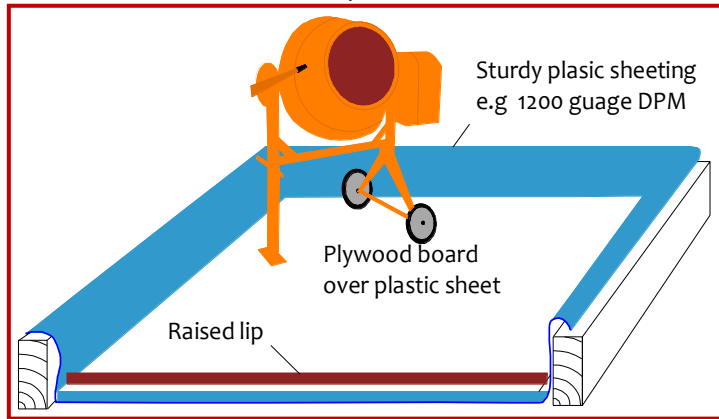
- 3.19.3. It may be acceptable to locate site cabins such that they act as a tree protection barrier and replace the specified protective fencing. Where this is being considered, written approval must be sought from the local authority.

3.20. Pedestrian Paving

- 3.20.1. If it is proposed to install new pedestrian surfaces over Root Protection Areas, excavation shall be limited to the removal of existing turf/vegetation plus an additional 50mm. Excavation shall be undertaken using hand tools only. Porous materials are preferred but not essential if the new surface covers less than 10% of the Root Protection Area. Paving with a thickness of 50mm bedded on mortar, or sand, bearing directly onto the ground, with a finished surface level with existing ground levels will be acceptable. No retaining kerbs shall be used.

3.21. Hazardous Materials

- 3.21.1. Any mixing of cement based materials shall take place outside the Construction Exclusion Zones and Restricted Activity Zones. Where cement is to be mixed at considerable distances from trees and water run-off cannot enter Root Protection Areas, then no further special measures are required. Otherwise, provision shall be made to ensure that the mixing area is contained so that no water run-off enters the Root Protection Area of any trees (see diagram for example). Mixers and barrows shall be cleaned within this area.
- 3.21.2. All other chemicals hazardous to tree health, including petrol and diesel, shall be stored in suitable containers as specified by current COSHH Regulations, and kept away from Root Protection Areas.





Section D: Post-Construction Phase

3.22. Removal of Tree Protection Barriers

- 3.22.1. This will be done after all major construction work is complete. Vehicular access will not be permitted within the Construction Exclusion Zones.
- 3.22.2. The local authority tree officer shall be made aware that the fencing is to be removed.

3.23. Landscaping

- 3.23.1. No machinery used within landscaping operations shall operate within the Root Protection Areas of retained trees.
- 3.23.2. Ground levels shall not be altered within Root Protection Areas without consultation and approval from the local authority.

3.24. Tree Planting

- 3.24.1. Trees planted in poor soils or compacted soils are unlikely to become established, so prior consideration should be given to rooting conditions. Where compaction or contamination is believed to have occurred expert horticultural or arboricultural advice should be sought.
- 3.24.2. Any new tree planting shall be carried out after completion of all construction activity in the vicinity.



4. Site Inspection

4.1. Inspection Schedule

- 4.1.1. In order to ensure that the trees are adequately protected it shall be necessary to confirm that the tree protection barriers and ground protection measures are installed to the satisfaction of the local authority. This will be done by the local authority tree officer or an appointed arborist (see Section 4.2 below) who will provide the tree officer with a copy of inspection details.
- 4.1.2. The following inspection schedule is suggested though the local authority may specify additional supervision where deemed necessary.

Inspection	Attendees	Comments
Pre- Start To occur prior to any works taking place on the site.	N/A.	Site manager to study this Method Statement & contact the appointed arborist to agree all protection measures.
Pre-Construction Meeting After tree works completed & tree protection barriers / ground protection measures installed. Prior to any other activity, inc. demolition & soil stripping.	Site manager, appointed arborist and/or local authority tree officer. *	Tree protection fencing locations & specification checked. Additional ground protection measures checked. Further protection measures / restrictions agreed.
Installation of new surface in Restricted Zone B.	Site manager, appointed arborist and/or local authority tree officer.	Attendance required at commencement.
Post-Construction Meeting Post major construction activity but prior to removal of fencing & landscaping operations.	Site manager, appointed arborist and/or local authority tree officer.	Retained trees inspected. Further landscaping operations and restrictions to be agreed.

* Where agreed with the L.A. it may be acceptable to supply photographs of the fencing to avoid the necessity for a site visit.

4.2. The Appointed Arborist

- 4.2.1. The appointed arborist must be acceptable to the local authority. He / she must have a good understanding of the project requirements and be suitably qualified to understand the hazards associated with development near to trees.
- 4.2.2. The appointed arborist should work closely with the site manager and shall have the authority to insist upon work stoppage until resolution of any major issues arising which could be detrimental to the health of protected or important trees.
- 4.2.3. The appointed arborist must keep the local authority updated at each of the stages within the inspection schedule and will advise on any unexpected issues arising throughout the project which could impact on trees.



5. Tree Works Schedule

5.1. Tree Works Specification

- 5.1.1. The following table specifies the tree works which will be required prior to the commencement of construction activity:

Tree Reference	Action Required	Notes
T1, T2, T6, T9, T10, T11, T12, G13 T14, T15, T17	Remove.	Stumps of trees within the RPAs of retained trees shall be removed with a stump grinder NOT a mechanical excavator.
T4, T5	Crown lift to a height of 3.5m.	See below.
G7	Prune back to the boundary where close to the rear-most proposed building.	See below.

- 5.1.2. **Pruning Standards:** Sympathetic pruning shall be carried out to BS 3998 (2010). Lopping of branches is to be avoided. Instead as system of 'drop crotching' or 'reduction via thinning' is to be used to achieve the desired clearance without spoiling the appearance, or form, of the trees. All pruning cuts shall be made close to the branch collar or a secondary growth point. Cuts to be made with sharp, clean tools. No wound sealants to be used.

- 5.1.3. **Additional works:** Any recommendations specified in the Tree Data Schedule (but not replicated in the above table) are intended to maintain the tree population in an acceptable condition. They are made for reasons of good arboricultural practice regardless of development proposals. However, they do not form part of this planning application. Where these trees are protected by a tree preservation order or are in a conservation area, consent must be sought from the local authority. Only the works listed in the table above form part of this planning application whereby no additional consent will be required if planning permission is granted.

6. Tree Protection Barriers

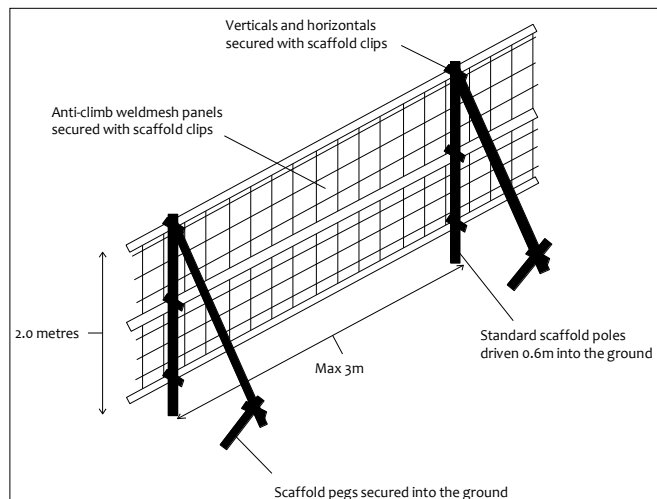
Detailed Specification

- 6.1.1. The purpose of tree protection barriers is to keep construction activity away from *Restricted Activity Zones* or *Construction Exclusion Zones*. They should be appropriate to the nature and proximity of activity within the site. The barriers should be erected prior to the commencement of all activity including demolition, soil stripping and delivery of materials and demolition (except where existing structures require demolition to enable the barriers to be installed). Barrier systems are specified below and should be installed according to the legend on the Tree Protection Plan.

6.2. The In-Ground System

- 6.2.1. This system may be installed where indicated by a solid purple line on the Tree Protection Plan. It should be robust enough to withstand occasional knocks by plant machinery and, once installed, shall remain in place throughout the entire construction phase.

- 6.2.2. Vertical scaffold poles are driven into the ground, onto which are affixed horizontal scaffold poles and diagonal bracing struts. Weldmesh panels (or similar – e.g. Heras type fencing panels, or 18mm+ plywood boards) are secured to this scaffold framework using sturdy clips e.g. standard scaffold clips. The system is illustrated in the diagram to the right and is based on BS 5837 guidelines.



6.3. The Back-Stay System

- 6.3.1. This system may be installed where indicated by a solid or dashed purple line on the Tree Protection Plan. It is more practical over existing hard surfaces or where the fencing needs to be moved to enable permitted activities within a *Restricted Activity Zone*. This system should be able to withstand occasional knocks by machinery and should not be relocated except with the consent of the site manager and the approval of the local authority.

- 6.3.2. Within this system, weldmesh fencing panels (minimum height 2m) are affixed into rubber or concrete feet and clipped together with anti-tamper couplers. Where topography permits, two couplers should be used, spaced at least 1m apart. Alternate panels should be

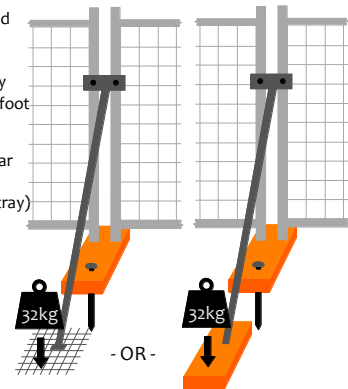
The 'Back Stay System' (an alternative to 'The In-Ground System')

2m X 3.5m weldmesh panels linked with anti-tamper couplings

Each panel attached to a back stay which is founded in an additional foot or mesh tray as illustrated

Minimum 32kg ballast to retain rear foot or tray (including the weight of the foot/tray)

Front feet to be secured with ground pins or additional ballast



attached to a diagonal back stay connected to an additional foot or baseplate secured with ground pins or additional ballast. Where ground pins are not used, the total weight of the foot/plate plus ballast should total not less than 32kg.

6.3.3. Alternatively, timber struts may be used to affix the panels to existing walls using brackets and screws where the fence panels are sufficiently close for this to be effective.

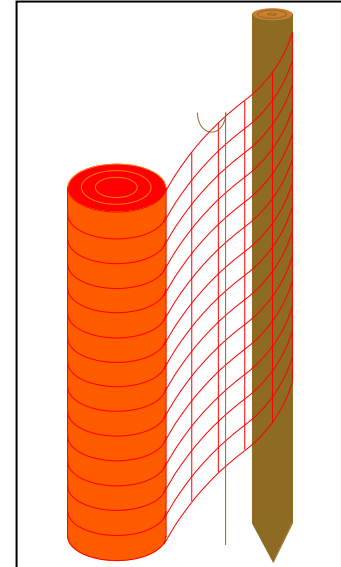
6.3.4. Where it is not possible to install diagonal struts (such as very close to a hedge) then the front feet shall be secured using ground pins or ballast.

6.4. The Barrier-Mesh System

6.4.1. Where indicated by a thick red line (solid or dashed) on the Tree Protection Plan, it shall be acceptable to install a less robust system than those specified above. This is because of the nature of construction activity or its distance from tree protection areas. The purpose of such a system shall be to demarcate the protection zone. It is not intended that such fencing will withstand knocks by construction machinery.



6.4.2. In this system, high visibility plastic safety fencing, 1m high, minimum grade 140g/m², is secured onto alternate wooden posts and fencing pins. Wooden posts to be located at 5m intervals, minimum dimensions 75mm.



6.5. Notices

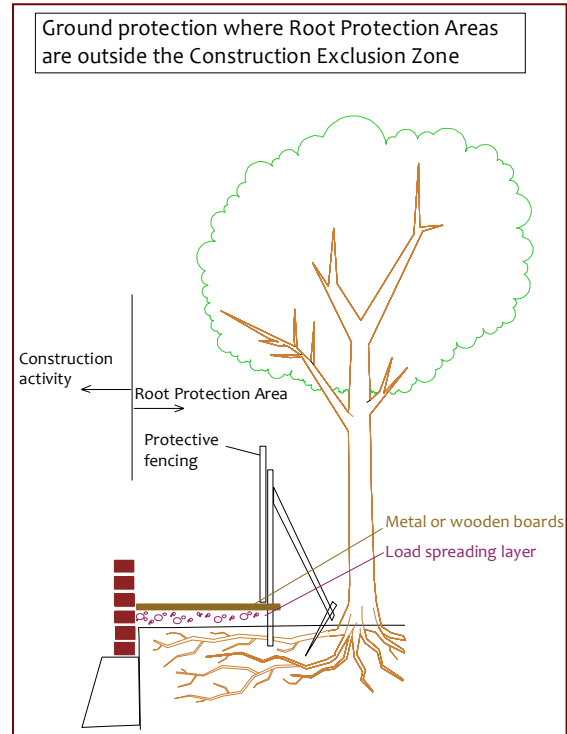
6.5.1. Suitable weather-proof notices should be displayed to identify tree protection zones. They should state the purpose of the fencing and that it should not be moved, or traversed, other than by authorised personnel.

7. Ground Protection Measures

Detailed Specification

7.1.1. Where indicated on the Tree Protection Plan (Restricted Activity Zones A and B), soils containing roots may be subject to compaction due to general construction activity (including pedestrian activity and use of plant machinery). In order to minimise compaction, it is proposed to ensure that a suitable load-spreading surface is in place at all times.

7.1.2. Any existing hard surfacing may be retained and reinforced (where applicable and adequate), otherwise suitable new ground protection measures shall be installed. The ground protection shall need to be able to adequately spread the load of construction traffic. Where existing hard surfacing is to be retained, it shall not be necessary to install additional ground protection measures. However, the hard surfacing must be firm enough to spread the load of any traffic passing overhead.



7.1.3. Where only pedestrian traffic will occur, the ground protection measures may be as simple as timber boards, or scaffold planks installed directly onto a geotextile fabric on the ground. The ground should first be made even by raking, or by adding a few centimetres of sand or woodchip. Alternatively the boards may be supported by a scaffold framework. The scaffold may be founded on poles driven into the ground and/or onto blocks (to raise the scaffold) with additional couplings to make the framework secure.

7.1.4. Where only light vehicles are to operate (e.g. barrows, trolleys or occasional cars), thick wooden boards or scaffold planks should also suffice, though at least 150mm of compressible woodchip will need to be installed first to help spread the load. Sturdier systems are specified below:

7.1.5. Where cars will regularly park or heavier vehicles/plant machinery will occasionally operate, sturdier ground protection measures will be required such as metal road plates, or purpose built synthetic road mats over a compression resistant layer such as 150mm of woodchip or 100mm of a 3D cellular confinement system in-filled with 7-40mm angular gravel (e.g. CellwebTM - see Section 7).

7.1.6. A temporary concrete slab may also be considered as a suitable load spreading platform. Where a pile driver needs to operate, a concrete slab may be the preferred option.

7.1.7. Where existing structures need to be removed, this shall be done with temporary ground protection measures in place to enable this to be achieved without compacting soils.

7.1.8. The ground protection measures shall be installed and approved before commencement of demolition and construction activity and before the arrival of plant machinery or materials. They shall remain in place until all heavy construction activity is complete or until they are due to be replaced with a new hard surface.

8. New Surfaces

Detailed Specification

8.1. No-Dig Driveway Installation

8.1.1. This section details the No-Dig Method which is proposed when installing the new surface over Root Protection Areas (Restricted Activity Zone B).

8.1.2. Ground Preparation - NO DIG

- Surface vegetation may be killed using a translocated herbicide such as GlyphosphateTM. Turf maybe lifted to a depth of 50mm using a hand operated turf lifting machine; mechanical excavators may not be used.
- Loose topsoil which contains a high degree of organic matter and is not suitable for bearing the hard surface may be removed using hand tools. If any roots in excess of 25mm, or an abundance of roots in excess of 10mm, are encountered, the excavation shall cease and the local authority shall be informed so that an appropriate response may be agreed. In such circumstances, exposed roots shall be covered with damp sacking or soil.
- Occasional roots in excess of 10mm which are severed shall be neatly pruned with secateurs to minimise the likelihood of infection. If no roots are encountered and the operation is being overseen by the local authority (or an approved appointed arborist), it may be possible to continue to excavate in strata of 50mm until the arborist overseeing the operation deems that excavation should cease.
- Any hollows should be filled with 2mm – 6mm chippings and a levelling layer of at least 25mm of sharp sand should be installed.

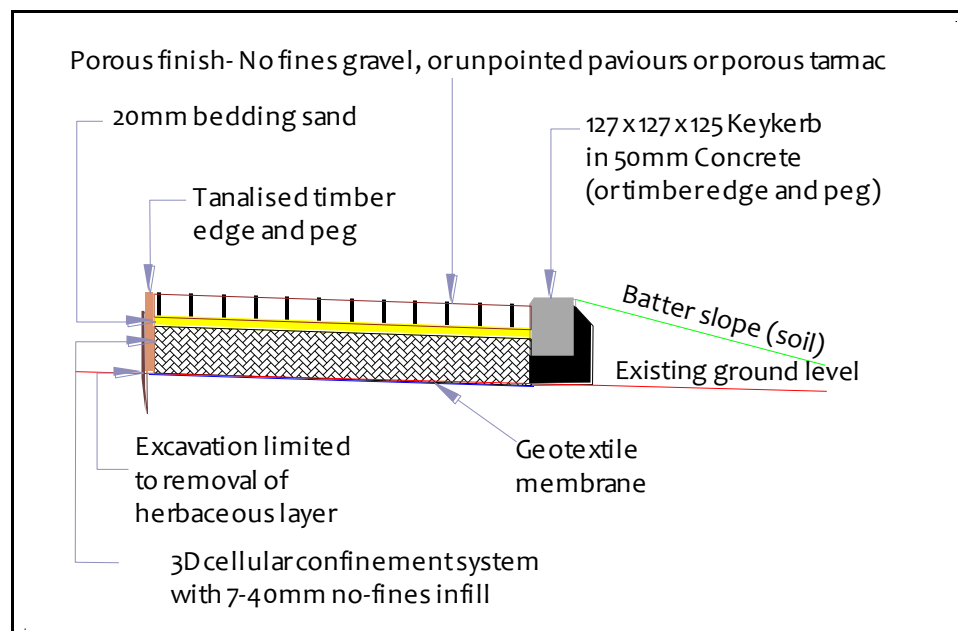
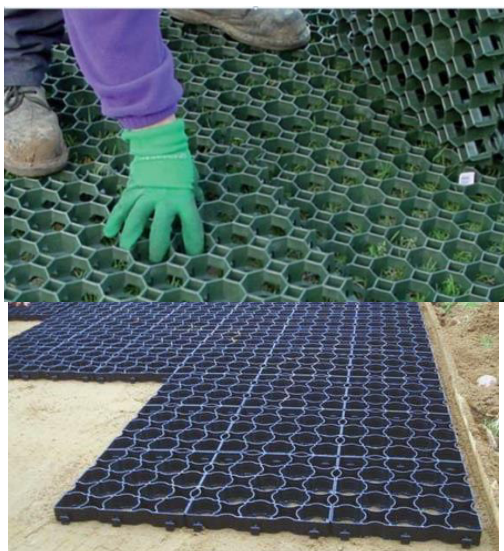


Figure 2: No-Dig Method

8.1.3. **Drive Edgings.** Edging solutions (such as kerbstones) requiring further excavation will not be acceptable within Root Protection Areas. Instead, an above ground system shall be installed such as a tanalised timber edge (treated for a 40 year design life) retained by narrow pegs driven into the ground. Alternative above ground systems must be approved by the local authority.



- 8.1.4. Where required, batter slopes may be installed to tie in with existing ground levels (max 1:3 gradient, maximum 100mm increase in ground level). However, no increase in ground level shall be permitted immediately adjacent to any tree stem or associated buttress roots.
- 8.1.5. **The sub-base.** Once the edgings are in place, a geotextile membrane shall be laid down to prevent root penetration into the road surface. A thin levelling layer of sharp sand or similar may then be installed.
- 8.1.6. A 3 dimensional cellular system should then be installed. This may either be a confinement system (flexible or rigid) which incorporates an aggregate, or a raft system that requires no aggregate. These three systems are all considered suitable for use over tree roots and are specified below:
- 8.1.7. **1) Rigid Cellular System** - A 3 dimensional cellular confinement system shall then be installed with a minimum thickness of 40mm. This may be filled with 7-14mm angular gravel. Example systems are illustrated below:



- 8.1.8. The entire cellular system shall be laid first and may be pinned in place using ground pins. This shall be followed by the infill, working from one end such that heavy machinery does not pass over any Root Protection Areas until the in-fill is installed.
- 8.1.9. **2) Flexible Cellular System** – see illustration. This will be filled with a no fines angular in-fill (e.g. 7 – 14mm or 20 – 40mm gravel).
- 8.1.10. I understand that a 100mm deep system is generally adequate to cope with light traffic, though this should be verified with the manufacturer and engineers. A limestone based in-fill will not be acceptable. Enough infill should be used to allow for settlement and compaction and no more. If required, the infill may be periodically topped up.
- 8.1.11. The entire cellular system shall be laid first and may be pinned in place using ground pins. This shall be followed by the infill, working from one end such that heavy machinery



does not pass over any Root Protection Areas until the in-fill is installed. The entire system may then be lightly compacted to a degree appropriate for the expected load.

- 8.1.12. Up to 50mm of 2 - 6mm clean hard grit (no fines) angular granular fill may be overlaid as a laying course.

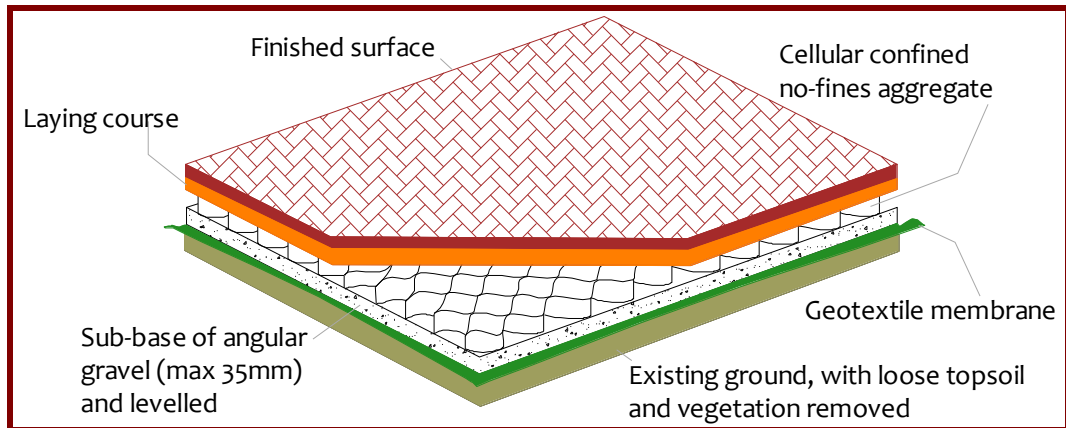
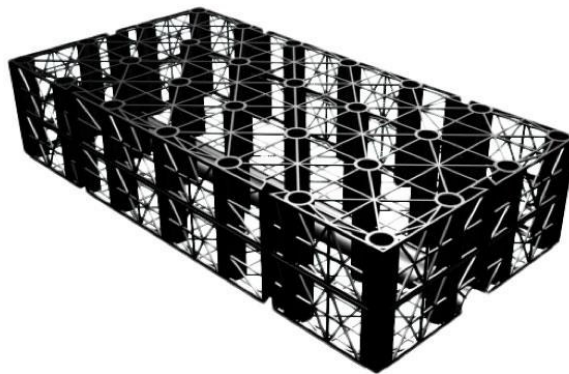


Diagram illustrating the cellular confinement system

3) Raft System (e.g. Arborraft™) – In this system, 85mm or 150mm deep polypropylene box structures are connected together to form a raft which sits above the ground and beneath the finished surface.



For situations other than very light usage, the 150mm system is recommended. This should be laid over a suitably thick geotextile. Another geotextile (or similar) is laid over the raft and any finished surface may then be installed according to engineers specifications. The finished surface may be porous or may be impermeable. If impermeable, ventilation and rainwater run off should be directed into the void. The overall thickness is likely to vary from 300mm to 450mm depending on the specification of the finished surface.

Care must be taken to ensure a suitable load spreading surface is in place before and during installation.

The advantage of this type of system (regarding roots) is that it is very light-weight (requiring no aggregate) and has an excellent load spreading capacity (reducing soil



compaction) whilst also providing maximum aeration and rainwater to the soils beneath. It can also be a very cost effective solution since no aggregate needs to be purchased and installed.

8.1.13. **The Finished Surface.** The following surfaces are acceptable over rooting areas:

- **No-Fines gravel.** This option offers the maximum permeability. However, loose gravel should be avoided close to the site entrance as it has a tendency to spill out into the adjacent public footway. Resin bonded gravel may be acceptable if it is shown to be sufficiently porous to enable rainwater to easily pass through to the sub-base below.
- **Block paving.** This is a good alternative as it allows a fair degree of permeability. Blocks with extra wide nibs shall be utilised to enable maximum infiltration of water between the blocks. Blocks shall be jointed with 1mm – 4mm clean hard crushed stone (no fines) brushed over the spaces and settled with the aid of a vibrating plate compactor.
- **Porous asphalt to BS EN 13108-7 (previously Pervious Macadam BS 4987 – 1 & 2).** This offers a degree of permeability and is preferred over concrete or asphalt containing-fines (e.g. *Stone Mastic Asphalt* (BS EN 13108-5) or *Hot Rolled Asphalt* (BS EN 13108-4)). This surface may require a porous binder course. Actual specification will vary according to ground conditions and expected load, and should be agreed with a Highways Engineer or Geotechnical engineer.
- **Concrete.** Concrete is impermeable so is only suitable for very small areas e.g. narrow paths where oxygen and rainwater runoff will be able to penetrate beneath the surface from the sides. It is possible to engineer a fully concrete solution whereby a concrete slab is supported by narrow piles with a ventilated void beneath. This is effectively a bridge over the Root Protection Area and needs to be specified by an appropriately qualified engineer. This system can provide an excellent solution but is rarely adopted due to the prohibitive cost.

8.2. Pedestrian Surfaces

- 8.2.1. If it is proposed to install new pedestrian surfaces over Root Protection Areas, excavation shall be limited to the removal of existing turf/vegetation plus an additional 50mm. Excavation shall be undertaken using hand tools only. Porous materials are preferred but not essential if the new surface covers less than 10% of the Root Protection Area. Paving with a thickness of 50mm bedded on mortar, or sand, bearing directly onto the ground, with a finished surface level with existing ground levels will be acceptable. No retaining kerbs shall be used.



9. Planting Scheme

9.1. Tree Planting Schedule

- 9.1.1. It is proposed to plant two standard sized trees in the locations indicated on the accompanying Proposed Planting Plan ref CCL/09185/PPP. And specified below:

Ref No	Species	N ^o	Size
N1	Blue Atlas Cedar <i>Cedrus atlantica f. glauca</i>	1	Heavy Standard 12-14 cm girth, 3.6 – 4.25m height
N2	Purple Beech <i>Fagus sylvatica 'purpurea'</i>	1	Heavy Standard 12-14 cm girth, 3.5m+

9.2. Tree Planting Specification

- 9.2.1. All stock shall be healthy and conform to BS 3936: 1992. *Nursery Stock. Part 1: Specification for Trees and Shrubs*. All stock to be materially undamaged, sturdy, vigorous, of balanced shape and without elongated shoots. Trees to be selected with a single, straight, stout stem and good graft union
- 9.2.2. All species are to be true to type, no substitutes are to be made without the written consent of the Local Planning Authority.
- 9.2.3. Any approved planting operations within the RPAs of retained trees are to be undertaken using hand tools only. No tracked / wheeled machinery to be used. No chemicals of any description to be used. No topsoil stripping, lowering or raising of ground levels (including the spreading of topsoil prior to seeding or turfing).
- 9.2.4. Ground which has been lightly compacted during construction is to be cultivated to a depth of 300mm. A minimum area of 1m x 1m for each tree.
- 9.2.5. Where chemical contamination or heavy compaction has occurred, or where the soil is determined to be relatively shallow or infertile, an appropriate amount of soil is to be removed and replaced with quality topsoil compliant with BS 3882. A minimum area 2m x 2m x 0.5m deep is to be replaced for each tree. Prior to backfilling with topsoil, bases and sides of all excavation to be de-compacted/loosened with a garden fork or spade.
- 9.2.6. Otherwise, a planting hole slightly larger than the root ball/ root spread shall be excavated by hand. The edge of the planting hole shall be roughened with a spade and the base dug over to a depth of 150mm to improve drainage.
- 9.2.7. The planting hole shall be backfilled with the same soil material and firmed to prevent air pockets.
- 9.2.8. Trees shall be planted with stem base at ground level, *Standard* trees (or smaller) shall be single staked at 30 - 50cm above ground level and attached with adjustable and flexible tree ties. *Heavy Standards* (or larger) shall be double staked at 80 - 1200cm above ground level and attached with adjustable and flexible tree ties. Stakes shall be driven into the ground such that they avoid the root ball. Stakes to be of tanalised timber with a minimum diameter of 75mm for *Standard* trees and 100mm for *Heavy Standards*.



9.2.9. Minimum area of 1.5m diameter around each tree to remain vegetation free. Seasoned woodchip or medium grade bark mulch to be installed to a depth of 100mm within this area to deter weed competition.

9.2.10. Trees to be planted late October to late March and well watered in immediately after planting.

9.3. Aftercare

9.3.1. Trees to be regularly watered during the first growing season and during prolonged dry spells for at least two further seasons.

9.3.2. Following is a guide to watering requirements, though in practice these are heavily dependent upon climatic conditions:

- All trees watered 3 times per month April through to September inclusive. During October, November and March the frequency may be reduced to 2 times per month. During December, January and February the frequency may be reduced to once per month.
- At each watering session heavy standards should receive 20 gallons, standards should receive 15 gallons and light standards should receive 10 gallons. This equates to approximately 10 minutes, 7.5 minutes and 5 minutes from a domestic hose at moderate pressure.
- The entire area beneath the canopy should be watered.
- After 2 years the trees should only require watering during periods of extended dry weather.

9.3.3. Tree ties to be checked annually and repaired / adjusted as required.

9.3.4. Stakes to be removed after 2 - 3 growing seasons.

9.3.5. Any trees which fail to become established are to be removed and replaced with a new tree of the same species and specification as the original.



PDF readers select *page-width* for detail & *page-view* for scrolling

Arboricultural Report to BS 5837: 2012 for: Venture Park Limited

Crown Ref: 09185

Site: 68-70 Meopham Road, Mitcham

Author: Ivan Button

Date: 15th October 2015

10. Signature

This report represents a true and factual account of the potential impact of development along with proposed protection measures at

68-70 Meopham Road
Mitcham
London
CR4 1BJ

Signed

Ivan Button N.C.H. (Arb), FDS_c (Arb), BSc (Hons), P.G.C.E., M. Arbor. A.

on behalf of

Crown Consultants Ltd

Dated

15th October 2015





Appendix 1: BS 5837: 2012 – Guidance Notes

This Standard prescribes the principles to be applied to achieve a satisfactory juxtaposition of trees and structures. It sets out to assist those concerned with trees in relation to design, demolition and construction to form balanced judgements.

It acknowledges the positive contribution trees may offer to a site, as well as the negative aspects of retaining inappropriate trees. It addresses the negative impacts that construction activity may have upon trees and offers mitigation strategies to minimise these impacts.

The Standard suggests a three stage approach to ensure best practice is followed when developing close to trees:

A1.1 Stage 1: Survey of Existing Trees

This identifies the existing trees on and adjacent to the site. Data is recorded for each tree and is presented in a Tree Data Schedule. Each tree is allocated a **Retention Category** according to its size, amenity value, condition and safe useful life expectancy. The categories are allocated independently of development proposals. Our interpretation of the Retention Categories is explained below:

A1.1.1 Retention Categories

A Category: Trees of high quality and amenity value. Usually, mature trees with a significant life expectancy which would enhance any development. Retention of these trees is strongly encouraged.

B Category: Trees of moderate quality and amenity value. Usually these are maturing trees or younger trees with exceptional form. Retention of these trees is desirable though the removal of occasional specimens may be acceptable.

C Category: Trees of low quality or small specimens with a relatively low amenity value. These trees are not considered to be a material planning constraint and their removal will generally be seen as acceptable in order to facilitate development.

U Category: Trees of such low quality that their removal is recommended regardless of development proposals.

A1.1.2 Occasionally trees are borderline and do not fall neatly into one of the categories A, B or C. In such cases we apply a superscript (+/-) such that:

C⁺ Indicates borderline C/B, though Category C is deemed to be most appropriate.

B⁻ Indicates borderline C/B, though Category B is deemed to be most appropriate.

A1.1.3 The British Standard suggests that each of the A, B and C categories may be further subdivided (A1, A2, A3, B1, B2, B3 etc) such that subcategory 1 denotes mainly arboricultural values, subcategory 2 denotes mainly landscape values and subcategory 3 denotes mainly cultural values (including conservation). Multiple subcategories may be used.

Our experience suggests that these subdivisions lack clarity and can be confusing. Within this report subcategories are **not** denoted. Where appropriate, the use of phrases such as 'Part of a formal group', or 'Has a high ecological value', or 'Offers good screening to the site' are incorporated into the observation section of the Tree Data Schedule. We believe this conveys all relevant landscape and cultural information without any confusion.

A1.1.4 **Tree Constraints Plan (TCP).** This indicates the position, crown spread, Retention Category and Root Protection Area of each tree. It is used to inform where development may proceed without causing damage to trees.



A1.1.5 Root Protection Area (RPA). This is the area around each tree likely to contain the majority of roots. It should ideally remain undisturbed to avoid a detrimental impact on tree health. For single stemmed trees It is calculated according to the formula “radius of RPA” = “12 x stem diameter”. For multiple-stemmed trees a more complex formula is used which may occasionally produce an RPA which seems inappropriately large relative to the trees canopy. This shape can then be modified to take into account site factors which influence rooting activity, e.g. foundations, soil type or impermeable surfaces. Where development works are proposed within the RPA they should be undertaken in a sympathetic manner to minimise root disturbance.

A1.1.5 Shade Constraints. The previous Standard (BS 5837 2005) suggested that shade constraints should be indicated on the TCP. These are denoted as a circle-segment drawn northwest to due east with a radius equal to the height of the tree. These do not represent the actual shade pattern which varies through the seasons. Rather, they indicate the area most shaded by the tree throughout the course of the year. Ideally habitable room windows should be located outside of these shade constraints. Where we consider it appropriate, we will include shade constraints information on our Impact Assessment Plan or Proposed Layout Plan.

A1.2 Stage 2: Arboricultural Impact Assessment

After the initial survey and the production of the Tree Constraints Plan, arborists and designers are encouraged to work together to establish a design proposal with minimal impact on the high quality trees. An assessment should be made of all possible impacts including the impact that the trees may have upon the proposal. The arborist may recommend mitigation strategies to minimise these impacts and help achieve a more harmonious juxtaposition between buildings and trees.

A1.3 Stage 3: Arboricultural Method Statement

This type of report specifies the measures necessary to protect trees against damage from construction activity. The Method Statement should be written in a manner that it may be conditioned and enforced by the local authority upon granting of planning permission. The site manager should be familiar with all aspects of the Method Statement and should ensure that all persons working on the site are aware of those aspects which appertain to their work. This includes service installation engineers and operators of plant machinery.



Appendix 2: Explanation of Tree Data & Glossary

This section explains the terms used in the **Tree Data Schedule** (see Section 3 and Appendix 6).

A4.1 General Observations

A4.1.1	Numbering System:	Each item of vegetation has its own unique number prefixed by a letter such that T1=Tree 1, G2=Group 2, H3=Hedge 3 and W4=Woodland 4, S5=Shrub 5.
A4.1.2	Age Categories:	
	Young	Usually less than 10 years old.
	Semi-Mature	Significant future growth to be expected, both in height and crown spread (typically below 30% of life expectancy).
	Early-Mature	Full height almost attained. Significant growth may be expected in terms of crown spread (typically 30-60% of life expectancy).
	Mature	Full height attained. Crown spread will increase but growth increments will be slight (typically 60% or more of life expectancy).
	Veteran	A level of maturity whereby significant management may be required in order to keep the tree in a safe condition.
	Over Mature	As for veteran except management is not considered worthwhile.
A4.1.3	Species:	Common names and Latin names are given.
A4.1.4	Height:	Measured from ground level to the top of the crown.
A4.1.5	Stem Diameter:	Taken at 1.5m above ground level where possible. On multi-stemmed trees this measurement may be taken at ground level, though usually an indication of the number of stems and average diameter is given, e.g. 3 x 30cm.
A4.1.6	Crown Height:	Measured from ground level to the height at which the main crown begins. Where the crown is unbalanced it is measured on the side deemed to be most relevant. This is usually the side facing the area of anticipated development.
A4.1.7	Tree Diagram:	This scaled drawing is computer generated based on measurements taken for stem diameter, crown height and spread, and overall height. It is designed to help the reader rapidly assess the data. It is not an accurate representation of the form of the tree.
A4.1.8	Crown Spread:	Measured N, E, S & W, taken from the centre of the stem and usually rounded up to the nearest metre.
A4.1.9	Observations:	If a tree's position is considered to be relevant it will be commented upon (e.g. overhanging a children's play area). Tree form and pruning history are also recorded along with an account of any significant defects. Defects and descriptive terms are dealt with in more detail at the end of this section.
A4.1.10	Recommendations:	Usually based on any defects observed and intended to ensure that the tree is in an acceptable condition.
A4.1.11	Priority Scale:	Depending upon the threat posed by the tree, and the likelihood of failure, recommendations should be carried out according to the following priority scale:
	Urgent	To be carried out as soon as possible.
	Very High	To be carried out within 1 month.
	High	To be carried out within 3 months.
	Moderate	To be carried out within 1 year.
	Low	To be carried out within 3 years.
A4.1.12	Inspection Frequency:	An interval of 6 months, 1 year, 1.5 years or 3 years is allocated before the next inspection is due. Wherever practical, consideration should be given to seasonal changes so that deciduous trees are not always surveyed in winter when they have no leaves, or in summer when leaves may obscure branches within the upper crown.
A4.1.13	Vigour:	An indication of growth rate and the tree's ability to cope with stresses:
	High	Having above average vigour.
	Moderate	Having average vigour.
	Low	Having below average vigour.
	Very Low	Tree is struggling to survive and may be dying.
A4.1.14	Physiological Condition:	
	Good	Healthy and with no symptoms of significant disease.
	Fair	Disease present or vigour is impaired.
	Poor	Significant disease present or vigour is extremely low.
	Very Poor	Tree is dying.
A4.1.15	Structural Condition:	
	Good	Having no significant structural defects.
	Fair	Some defects observed though no high priority works are required.
	Poor	Significant defects found. Tree requires monitoring or remedial works.
	Very Poor	Major defects which will usually require significant remedial works or tree removal.
A4.1.16	Amenity Value:	
	Very High	Exceptional specimen, observable by a large number of people.
	High	Attractive specimen, observable by a significant number of people.
	Moderate	One of the above factors is not applicable.
	Low	Unattractive specimen or largely hidden from view.
A4.1.17	Life Expectancy:	The estimated number of years before the tree may require removal. Classified as (<10), (10 – 20), (20 – 40), or (40+).
A4.1.18	Retention Category:	These are explained in detail in Appendix 1.

A4.2 Evaluation of Defects

Cavities, wounds, deadwood etc are all evaluated as follows:

Major	Such that structural integrity is, or will become, compromised and the tree is, or will inevitably become, hazardous.
Significant	A defect that may over time become a major defect, though not necessarily so. This will depend on the vigour of the tree and its ability to deal with decay etc.
Minor	A defect that is not likely to compromise the tree's structural integrity.



General Glossary

Adaptive growth	In tree biomechanics, the process whereby wood formation is influenced both in quantity and quality by the action of gravitational forces and mechanical stresses on the cambial zone.
Aerobic	Conditions in which oxygen is freely available, or to biomechanical processes that depend on the presence of oxygen.
Anaerobic	A condition marked by the absence of oxygen; Generally such areas are unsuitable for normal life and growth of plant tissues. These sites tend to be populated by bacteria capable of surviving low oxygen conditions often associated with Slime Flux.
Arboriculture	The culture and management of trees as groups and individuals primarily for amenity and other non-forestry purposes.
Arborist	A person possessing the technical competence through experience and related training to provide management of trees or other woody plants in a landscape setting. Generally involved with the development or management of trees for visual amenity or land management rather than the growth of trees for product or profit.
Barrier zone	A layer within an annual increment of wood which contains abnormal xylem cells, laid down by the cambium in response to wounding or other trauma.
Body language	In trees, the outward display of growth responses and or deformation in response to mechanical stress.
Bole	Or Trunk, the main stem of a tree below its first major branch.
Bracket	A type of fruiting body produced by various fungal species, plate like to hoof like in shape and often a one sided attachment to the wood or bark.
Branch bark ridge	A ridged area located at the union of a branch to a trunk or stem.
Branch Collar	Trunk tissue that forms around the base of a branch between the main stem and the branch, or between a main branch and a lateral branch. As a branch decreases in vigour or begins to die, the collar usually becomes more pronounced and completely encircles the branch.
Brown Rot	Form of decay where cellulose is degraded, while lignin is only modified.
Buttress Root	Roots that emerge from the base of the tree stem, normally large and well developed that rapidly reduce in diameter to create the Root Plate this offers structural support for the tree. Buttress roots divide rapidly forming the connection between the stem and the transport roots.
Cabling Bracing	Installing cables within the crown of a tree to prevent collapse.
Callus	Undifferentiated cells often formed at the edges of recent injuries. This tissue quickly becomes differentiated, forming cells of the type characteristic of that position on the tree (e.g. forming wood, bark, roots, etc.) see wound response tissue.
Cambium	A thin layer of actively growing and dividing cells, located between the xylem (sapwood) and bark of a plant; the part responsible for radial growth of a tree stem or branch.
Canopy	The topmost layer of twigs and foliage in a woodland, tree or group of trees.
Canker	A localised area of dead bark and cambium on a stem or branch, caused by fungal or bacterial organisms, characterised by woundwood development on the periphery. This may be annual or perennial.
Cavity	An open and exposed area of wood, where the bark is missing and internal wood has been decayed and dissolved.
Chlorotic	Also Chlorosis. A condition of the plant marked by yellowing of normally green foliage, often indicating nutrient deficiency or plant dysfunction.
Clinometer	Devices that measures vertical angles, and provides direct height measurements of objects by triangulation.
Co-dominant stems/trunk	Are forked branches or trunks of nearly the same size in diameter and lacking a normal branch union.
Compacted soils	Soils in which the air-space (oxygen space) has been reduced or eliminated, reducing water infiltration and percolation, reducing root presence and inhibiting new root development.
Compartmentalisation	The physiological process that creates the chemical and mechanical boundaries that act to limit the spread of disease and decay organisms.
Compression Failure	Localized buckling of fibres and other longitudinal elements produced by compression of wood along the grain; compression failures sometimes develop in standing trees.
Compression Strength	The ability of a material or structure to resist failure when subjected to compressive loading; measurable in trees using special drilling devices
Compression Wood	Abnormal wood formed on the lower side of branches and curved stems, with physical properties different from normal wood.
Conservation Area	In Great Britain, designated areas of architectural or historical interest, in which there are special procedures for planning applications. Additionally tree works cannot generally be undertaken without prior notification (Currently 6 weeks) to the relevant local planning authority. See also Tree Preservation Orders.
Core Sample	A sample of wood extracted from a trunk or branch, using an increment borer tool. The resulting core can be analysed for characteristics of growth, wood strength, structure, decay, and for species identification.
Crotch	The union of two or more branches; the auxiliary zone between branches.
Crown	The upper canopy of a tree, including upper trunk, scaffold branches, secondary branches, stems and leaves.
Crown lifting / raising	Crown Lift The removal of the lowest branches, usually to a given height. It allows more residual light and greater clearance underneath for vehicles etc.
Crown reduction	The reduction of a tree's height or spread while preserving its natural shape.
Crown thinning	The removal of some of the density of a tree's crown, usually 5-25% allowing more light through its canopy and reducing wind resistance.
Deadwood (noun)	Deadwood is often present within the crown or on the stems of trees. It may be an indication of ill health, however, it may also indicate natural growth processes. If a target is present beneath the tree, deadwood may fall and cause injury or damage and should be removed, otherwise deadwood can remain intact for conservation purposes (insects, fungi, birds etc.).
Deadwood (verb)	The removal of dead branches from a tree's canopy, usually of a specified size (in diameter).
Decay	Progressive deterioration of organic tissues, usually caused by fungal or bacterial organisms, resulting in loss of cell structure, strength, and function. In wood, the loss of structural strength.
Decay Detection	The assessment of decay within a tree has been traditionally difficult, but recent advances have made it possible to achieve accurate representations of the internal section of a tree in both 2D and 3D, removing doubt over the condition of the tree and allowing accurate management decisions.
Defect	In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment.
Defoliation	The losing of plants foliage.
Dieback	Progressive death of buds, twigs and branch tissues, on individual limbs resulting in Deadwood, or throughout the canopy,



	extreme cases can result in Stag Heading.
Dripline	A projected line on the ground that corresponds to the spread of branches in the canopy; the farthest spread of branches.
Epicormic shoots	Fast growing, weakly attached shoots/branches that often grow as a response to stress factors upon a tree or branch removal.
Failure	In connection with tree hazards, a partial or total fracture within the wood tissue or loss of cohesion between roots and soil. (In total failure affected parts will snap or tear away completely, Partial failure there is a crack or deformation, which results in an altered distribution of mechanical stress.
Feeder Roots	Fine fibrous Water and nutrient absorbing roots located in the outer root system.
Flush-Cut	In trees and shrubs, a pruning cut close to the parent stem, which removes the branch bark ridge.
Foliage	The live leaves or needles of the tree; the plant part primarily responsible for photosynthesis.
Formative pruning	The trimming of a tree to remove weaknesses and irregularities which may lead to problems. The formative pruning operation is aimed at reducing the potential for future weaknesses or problems within the tree's crown.
Gall	An abnormal, disorganized growth of plant tissues, caused by parasitic or infectious organisms such as insects, fungi, bacteria, or viruses.
Girdling	In woody plants, any form of damage that destroys the bark and / or the Cambium all the way around the stem, branch or root, normally resulting in death of the damaged section.
Girdling Root	In woody plants, a root that grows across the buttress, or across other roots, eventually causing constriction of the radial growth.
Growth Increment	The incremental growth added as new annual ring develops each season over existing wood. This is seen as (growth) rings in cross-sections of wood.
Hazard beam	An upwardly curved branch in which strong internal stresses may occur without the compensatory formation of extra wood (longitudinal splitting may occur in some cases).
Heartwood	Inner non functioning tissues that provide structural support to trunk.
Heave	In relation to shrinkable clay soils, expansion due to rewetting of a volume of soil previously subjected to the removal or water by plant / trees following felling or root severance. Also in relation to root growth, the lifting of pavements and other structures by radial expansion. Also in relation to tree stability, the lifting of one side of a wind rocked root plate.
Herbicide	A chemical compound that causes the death of a plant.
Included Bark	Bark that becomes embedded in a crotch between branch and trunk or between co-dominant stems, usually found in narrow or tight crotches, and causes a weak structure.
Increment Borer	A tool that cuts and extracts a narrow cylinder of wood from a tree for analysis of the wood tissue and growth increments.
Leader	The primary terminal shoot or trunk of a tree.
Limb	A large lateral branch growing from the main trunk or from another larger branch.
Lion Tailing	Often the result of poor pruning practices; the main leader or branches are largely devoid of side branches, growth is restricted to the end of branches and is likely to suffer damage through end loading.
Lopping	In trees, a general term that related to the removal of branches from a tree.
Monitoring	Due to the relative life span of trees in relation to our own, long-term monitoring provides a valuable insight to the health of trees, identifying decline and or stabilisation and or improvement.
Mulch	A material laid over the root system of a tree to help conserve moisture within the soil. Additionally it may help control the development of weeds close to the tree.
Mycelium	A mass of growing filaments (hyphae) formed by fungi.
Mycorrhizae	The symbiotic relationship between roots and certain beneficial fungi. Mycorrhizae are the combined root / fungal growth.
Occluding tissue	The general term of wood, cambium and bark that develop around the site of a wound on a woody plant
Pathogen	A microorganism that causes diseases within another organism.
Phloem	The principle conductive tissue that the products of Photosynthesis are transported around the plant
Photosynthesis	The process were light energy is used to create energy (Carbohydrate) for use within the plant.
Pollard	A term for a pollarded tree.
Pollard head	The swollen section of branch / stem that forms behind the pollarding cut.
Pollarding	The complete or partial removal of the crown of a young tree so as to encourage the development of numerous branches either for amenity or historically as fodder, repeated management is required cyclically to maintain the feature
Prune or Pruning	Selective removal of woody plant parts of any size, using saws, Loppers, Secateurs, or other pruning tools.
Reaction Wood	Wood with distinctive anatomical characteristics, formed in parts of leaning or crooked stems and in branches to provide additional strength / support. In hardwoods, tension wood usually forms. In conifers, compression wood is usually found.
Reaction Zone	A zone normally darker than surrounding wood that denoted the boundary often a defensive one between functional sapwood and dysfunctional or decaying wood.
Re-grading	The raising or lowering of a soil profile from its original grade.
Remedial pruning	The removal of old stubs, deadwood, epicormic growth, rubbing or crossing branches and other unwanted items from the tree's crown.
Resistograph	Invasive decay detection technique whereby the resistance offered by the timber to a spinning probe is measured and plotted.
Rib	In tree body language, a long narrow, axial protuberance which often over lays a crack.
Ring Barking	Artificial Girdling of the stem, to result in the death of a tree. May be used in habitat creation were the retention of dead standing trees is required.
Rod Bracing / Bolting	Traditionally, this has relied upon the Installation of steel rods or bolts through the stems or limbs, to reduce twisting or splitting of the wood. The installation of such features does require legal interpretation.
Root Barriers	Both Buildings and services can benefit from the installation of root barriers to protect a soil volume from the ingress of roots.
Root Collar	The basal area of the tree; transition zone from trunk to root. Also sometimes called trunk flare.
Root Plate	The primary support area for the tree; an area of the root system close to the base that structurally anchors the tree to the soil.
Root Rot	Either a general term for decay within the wood of the lower stem / buttress roots, or a disease in which the fine roots are killed.
Root System	The portion of the tree containing the root organs, including buttress roots, transport roots, and fine absorbing roots; all underground parts of the tree.
Root Zone	The area and volume of soil around the tree in which roots are expected. May extend to three or more times the branch spread of the tree, or several times the height of the tree.
Sail Area	That area or the tree subjected to wind load.



Sapwood	Xylem wood tissue, usually light in colour, representing the outer growth rings of the wood. Usually living, reactive wood tissue, in a healthy tree. See heartwood
Scaffold limbs / scaffold Branches	The branches that from the main network framework of the crown of a tree.
Senescent	A decline in growth and vigour due to age or stress factors.
Shrub	A woody plant that branches at or close to the ground level and so does not have a single stem.
Slime Flux	Relating to a toxic condition from the spreading of bacteria or their products from a source of infection; characterized by malodorous gases, or salt deposits upon the bark. If these products enter the sap stream, localised vessel necrosis can result, usually associated with anaerobic conditions.
Soft Rot	A kind of wood decay, were a fungi degrades cellulose within the cell wall, without causing overall degradation.
Soil Compaction	The compression of soil, causing a reduction of pore space and an increase in the density of the soil. Air is squeezed out and nutrients become locked. Tree roots cannot grow in compacted soil.
Sonic Decay Detection	Non invasive method whereby sound waves are passed through the tree and the speed is measured. Slow speeds indicate decay and a tomography picture representing the inner stem is produced.
Stag Heading	In a tree, a state of dieback where dead branches protrude beyond the current living crown.
Stress	In plant physiology, conditions where one or more physiological functions are not working within normal parameters.
Stump Grinding	The removal of a tree stump using a specialist grinding machine.
Subsidence	In relation to vegetation, the removal of water by plant growth resulting in localised shrinkage in the soil volume.
Sucker	Same as sprout.
Suppressed	Trees which are dominated by surrounding vegetation and whose crown development is restricted from above.
Systemic	Affecting the whole plant or organism. A systemic compound is carried throughout the entire plant to all parts through the vascular system.
Target	Any person or object within reach of a falling tree or part of a tree that may be injured or damaged.
Target Pruning	The pruning of a branch where the wound affects only branch material, often results in a target shaped wound.
Tension Wood	Reaction wood typically formed on the upper side of limbs or curved stems; characterized by lack of cell wall lignifications (higher ratios of cellulose to lignin).
Tight Union / Tight Crotch	Also, narrow crotch. A crotch with a narrow angle between branches, often having included bark.
Tomography	The comparison of sound or stress waves through the tree allows the creation of a 2D or 3D representation of the internal structure of a stem or branch section and highlights areas of damage. Virtually non-injurious.
Topography	The configuration of surface features, including the vertical and horizontal relationships of the ground and other features.
Topping	Cutting large limbs back severely, without regard to form or habit of the tree. Cuts are usually made between lateral branch nodes. This practice is extremely injurious to trees, and promotes decay and structural weakness within the crown.
Tree	A woody plant that typically has a single stem, at maturity has a height of at least 4 metres and a stem diameter at breast height of at least 75mm.
Tree Preservation Order	In Great Britain, an order made by the local planning authority, where consent must be gained before undertaking all but exempt works to a tree.
Trunk Flare	The basal area of the trunk that flares or widens, and merges with the main roots. See root collar
Veteran Tree	Veteran trees are often found in large parks or estates and commonly affected by extensive decay or have been subject to extensive works. These trees are retained for historical importance and often pose greater risk than normal, which is generally justified. They need careful management and often propping or bracing to support them, some require fencing to limit access.
Vigour	Active, healthy growth of plants: ability to respond to stress factors.
Visual Tree Assessment (VTA)	An assessment of the mechanical condition of trees based upon their 'body language'. Trees are dynamic and respond to faults / decay / environmental factors in various ways, these responses can be indicative of structural integrity.
Wetwood	An infection caused by bacteria living inside the plant tissues. The bacteria ferment the plant fluids, resulting in death of nearby cells, and often causing exudations of fluid from the bark, often referred to as a Slime Flux.
White Rot	A kind of wood decay where a fungi attacks the lignin within the wood matrix
Wind loading	Forces placed upon tree canopy, branches, trunk and roots of a tree under windy conditions.
Wind Throw	The failure of a tree due to wind loading.
Witches Broom	A deformed or unusual growth of twigs from adventitious buds, caused by insects, disease, or dieback of twigs and buds.
Wood	Secondary Xylem; the main structural support and water conducting tissue of trees and shrubs.
Wound Response Tissue	Also Occluding Tissue, Wound Wood or Callus. Differentiated wood tissue that grows around the margins of a wound or injury.
Wound Wood	Wood with atypical features, formed in the vicinity of a wound and a term to describe the occluding tissues around a wound
Xylem	Plant tissues with special function of translocation of water and dissolved nutrients.



Appendix 3: Survey Methodology

- A2.1 Ground level visual surveys are carried out using the *Visual Tree Assessment* technique described by Mattheck and Broeler (1994) and endorsed by the Arboricultural Association (LANTRA Professional Tree Inspection course, 2007).
- A2.2 Structural condition is assessed by inspecting the stem and scaffold branches from all angles looking for weak branch junctions or symptoms of decay. Particular attention is paid to the stem-base. Cavities are explored using a metal probe in order to assess the extent of any decay. If this is not possible further inspection is recommended in the form of a climbed inspection or using specialist decay detection equipment.
- A2.3 The physiological condition is assessed by inspecting the stem, branches and foliage for symptoms of disease. The overall vigour of the tree is also taken into account.
- A2.4 Where significant defects are observed, recommendations are made according to a scale of priority in order to reduce the likelihood of structural failure. The position of the tree and its potential targets are taken into account.
- A2.5 Measurements are obtained using a diameter tape, clinometer, distometer and loggers tape. Where this is not practical measurements are estimated.
- A2.6 Some trees are surveyed as groups, though this is usually avoided close to areas likely to be developed.
- A2.7 Finally, a *Retention Category* is allocated as described in Appendix 1.1.1.

Appendix 4: Author's Qualifications

Qualifications & Experience of Ivan Button N.C.H. (Arb), FDS (Arb), BSc (Hons), P.G.C.E., M. Arbor. A.

Construction

Between 1983 and 1995 Ivan worked primarily within the construction industry and received training in a broad range of practical building skills and general construction principles. During this time he obtained a BSc (Hons) at Leeds University followed by a P.G.C.E at The University of Wales.

Arboriculture

He obtained a NCH (Arboriculture) at the University of Lincoln and became a member of the Arboricultural Association. He then worked for an Arboricultural Consultancy for one year before establishing a tree surgery and landscaping business in 1998. In 2005 Ivan commenced full time employment with a leading Arboricultural Association approved consultancy and soon adopted a senior role responsible for five consultants.

He obtained a FDS in arboriculture at the University of Lancashire, which he passed with distinction and is now a Director and Principal Consultant of Crown Consultants Ltd. He is accredited as a LANTRA *Professional Tree Inspector*. A qualification produced in association with the Arboricultural Association and generally recognised as appropriate for all levels of tree inspection.

He is a member of the Consulting Arborist Society and is listed within their areas of professional expertise for QTRA and as an expert witness.

Ivan is a professional member of the Arboricultural Association and the International Society of Arboriculture.

He is a licensed Quantified Tree Risk Assessment user.

Ivan has undertaken professional expert witness training and has been registered as a Sweet and Maxwell Checked Expert Witness since 2008.

Throughout 2009 acted as the principal Tree Officer for Barnsley Metropolitan Borough Council.

Ivan has produced several hundred Arboricultural Reports for the purposes of Development, Safety, Management, Mortgage, Subsidence, Mitigation and Litigation.



PDF readers select page-width for detail & page-view for scrolling

Arboricultural Report to BS 5837: 2012 for: Venture Park Limited

Crown Ref: 09185

Site: 68-70 Meopham Road, Mitcham

Author: Ivan Button

Date: 15th October 2015

Appendix 5: Further Information

Building Near Trees – General

National Joint Utilities Group publication # 10 (1995), *Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees*. Downloadable at www.njug.demon.co.uk/pdf/NJUG%20Publication10.pdf

NHBC Standards Chapter 4.2., *Trees and Buildings*.

Horticulture LINK project 212. (University of Cambridge, 2004), *Controlling Water Use of Trees to Alleviate Subsidence Risk*.

Tree Planting and aftercare

See www.trees.org.uk/leaflets.php# for downloadable leaflets on selecting a garden tree, planting, aftercare and veteran tree management.

British Standards

BS 5837: 2012. Trees in Relation to Design, Demolition and Construction – Recommendations.

Bs 3998: 2010. Recommendations for Tree Work.

BS 3936: 1992. Nursery Stock. Part 1: Specification for Trees and Shrubs.

BS 3936: 1992. Nursery Stock. Part 10: Specification for Groundcover Plants.

BS 4043: 1989. Transplanting Root-balled Trees.

BS 8004: 1986. Foundations.

BS 8103: 1995. Structural design of Low-Rise Buildings.

BS 8206: 1992. Lighting for Buildings.

BS 8545:2014. Trees: From nursery to independence in the landscape – Recommendations

BS 3882: 2007. Topsoil.

BS 4428: 1989. General Landscaping Operations (excluding hard surfaces).

Permission to do Works to Protected Trees / Tree Law

Forestry Commission (Edinburgh, 2003), *Tree Felling – Getting Permission*. Country Services Division - Forestry Commission. Downloadable at [www.forestry.gov.uk/website/pdf/nsf/pdf/wgsfell.pdf/\\$FILE/wgsfell.pdf](http://www.forestry.gov.uk/website/pdf/nsf/pdf/wgsfell.pdf/$FILE/wgsfell.pdf)

Transport and the Regions (Department of the Environment, 2000), *Tree Preservation Orders, A Guide to the Law and Good Practice*. Downloadable at www.communities.gov.uk/publications/planningandbuilding/tposguide

C. Mynors, *The Law of Trees, Forests and Hedgerows* (Sweet and Maxwell, London, 2002)

Communities and Local Government website with numerous downloadable documents, from: <http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/>

Lighting Levels

P.J. Littlefair, B.R.E. 209: *Site layout planning for daylight and sunlight A guide to good practice*. B.R.E. Bookshop, London.

British Standards Institution. Code of practice for day lighting. *British Standard BS 8206: Part 2* (1992).

Chartered Institution of Building Services Engineers. *Applications manual: Window Design* (London, 1987).

NBA Tectonics. A study of passive solar housing estate layout. *ETSU Report S-1126*. Harwell, Energy Technology Support Unit (1988).

I.P. Duncan; D. Hawkes, Passive solar design in non-domestic buildings. *ETSU Report S-1110*. Harwell, Energy Technology.

P. J. Littlefair, Measuring Daylight, *BRE Information Paper 23/93 f3.50*. (Advises on measuring daylight under the real sky or an artificial sky, allowing for the changing nature of sky light).

High Hedges

Communities and Local Government website with numerous downloadable documents, from: <http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/>

Tree Specific Websites

www.crowntrees.co.uk

Crown Consultants site containing useful information

www.trees.org.uk

Arboricultural Association

www.rfs.co.uk

Royal Forestry Society of England, Wales and N. Ireland

www.treehelp.info

The Tree Advice Trust

www.woodland-trust.org.uk

The Woodland Trust

www.treecouncil.org.uk

The Tree Council



PDF readers select *page-width* for detail & *page-view* for scrolling

Arboricultural Report to BS 5837: 2012 for: Venture Park Limited

Crown Ref: 09185

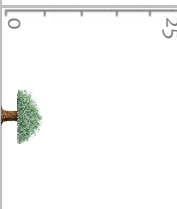
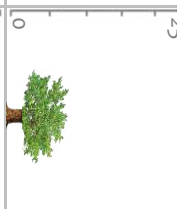
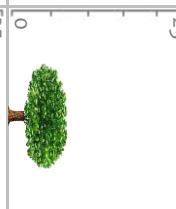
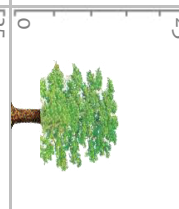

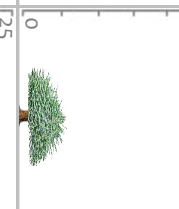
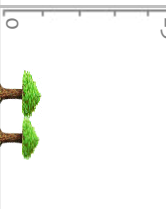
Site: 68-70 Meopham Road, Mitcham

Author: Ivan Button

Date: 15th October 2015

Appendix 6: Tree Data Schedule and Site Plan(s)

The Tree Data Schedule and all plans accompanying this report follow this page. They are also provided as separate documents for ease of printing and referring between when viewing on a screen.

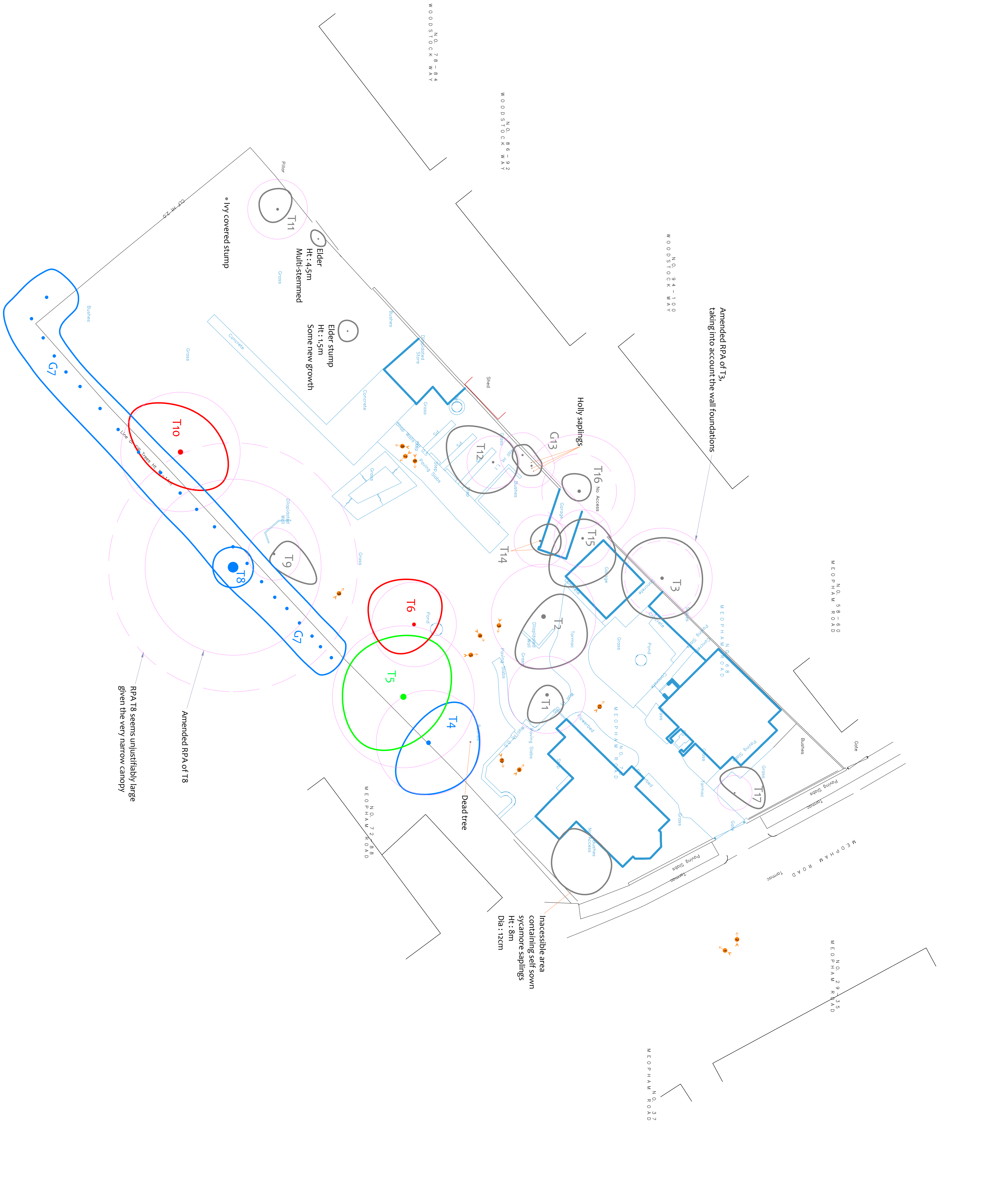
Reference	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)	Scaled Tree Diagram (m)	Notes	Recommendations				Vigour		Amenity Value			
								Priority		Inspect (Freq (yrs))	Independent of any development proposals	Physiological Condition	Structural Condition	Life Expectancy (yrs)	Retention Category		
								W	S							W	S
T1	Early-Mature Apple Malus sp.	4	1.5	31	2 1 3		Position: Situated within the rear garden. Form: Twin-stemmed at ground level with a poorly formed crown. History: Reduced. Defects: Significant decay throughout (acceptable condition at present). Other: Poor specimen.	No action required.		n/a	3	Very Low	Poor	Low	<10	C -	
T2	Mature Mulberry Morus nigra.	7	1.5	42	5 3 5		Position: Situated within the rear garden. Form: Multi-stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Large pruning wound with some decay at 2m (acceptable condition at present).	No action required.		n/a	3	Moderate	Fair	Fair	Moderate	10-20	C
T3	Mature Elder Sambucus nigra.	7	2	30	4 4 4		Position: Situated on third party land. Form: Multi-stemmed at 1m with a balanced crown. History: No evidence of significant pruning. Defects: No defects observed.	No action required.		n/a	3	Moderate	Good	Fair	Low	10-20	C
T4	Semi-Mature Oak Quercus robur.	14	3.5	42	5 5 2		Position: Situated within the rear garden. Form: Single stemmed and vertical with an unbalanced crown. History: No evidence of significant pruning. Defects: No defects observed.	No action required.		n/a	3	Moderate	Good	Good	Moderate	40+	B
T5	Early-Mature Oak Quercus robur.	14	2	57	4 6 6		Position: Situated within the rear garden. Form: Single stemmed and vertical with a well-formed crown. History: No evidence of significant pruning. Defects: No defects observed.	No action required.		n/a	3	Moderate	Good	Good	Moderate	40+	A
T6	Over-Mature Apple Malus sp.	5	1	34	2 4 3.5		Position: Situated within the rear garden. Form: Twin-stemmed at 1m with an unbalanced crown. History: Occasional pruning wounds due to crown reduction. Defects: Major cavities throughout. Other: 2 stems at 26 and 22cm in diameter.	Remove.		Low	N/A	Very Low	Poor	Poor	Low	<10	U
G7	Semi-Mature Leyland Cypress X Cupressocyparis leylandii.	av 3.5	av 3	av 30	av 1 2		Position: Situated on third party land. Form: Single stemmed and vertical with a narrow, upright habit (hedge). History: No evidence of significant pruning. Defects: No defects observed.	No action required.		n/a	3	High	Good	Good	Moderate	40+	B

Reference	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)			Vigour	Amenity Value
					W N S E	9 0 9		Priority	Inspect Freq (yrs)	Physiological Condition	Structural Condition	Life Expectancy (yrs) Retention Category
T8	Mature Lombardy Poplar <i>Populus 'italica'.</i>	18	8	100	2 2		Position: Situated on third party land. Form: Multi-stemmed at 2m with a narrow, upright habit. History: No evidence of significant pruning. Defects: No defects observed. Other: Limited inspection, dimensions estimated.	No action required.			Moderate Fair	Moderate 20-40 B
T9	Semi-Mature Oak <i>Quercus robur.</i>	12	4	21	2 0		Position: Situated within the rear garden. Form: Twin-stemmed at 2m with a compact crown. History: No evidence of significant pruning. Defects: No defects observed. Other: Poor form (high canopy).	No action required.			Moderate Good	Low 40+ C
								n/a 3			Fair	
T10	Semi-Mature Monterey Cypress <i>Cupressus macrocarpa.</i>	14	3.5	48	4 5 6		Position: Situated within the rear garden. Form: Twin-stemmed at 3.5m with a sparse crown. History: No evidence of significant pruning. Defects: Much dead foliage. Other: In decline. 2 stems at 36 and 31cm in diameter.	Remove.			Very Low Very Poor	Low 40+ U
T11	Semi-Mature Lawson Cypress <i>Chamaecyparis lawsoniana.</i>	10	1.5	24	2 2		Position: Situated within the rear garden. Form: Single stemmed and vertical with a sparse crown. History: No evidence of significant pruning. Defects: No defects observed.	No action required.			Low Fair	Low 40+ C
								n/a 3			Good	
T12	Semi-Mature Apricot <i>Prunus armeniaca.</i>	4	1	21	2.5 5		Position: Situated within the rear garden. Form: Twin-stemmed at 1.5m with a low, wide spreading habit. History: Occasional pruning wounds due to crown lifting. Defects: No defects observed.	No action required.			Moderate Good	Low 40+ C
G13	Semi-Mature Holly <i>Ilex aquifolium.</i>	av	av	av	1 1 1		Position: Situated within the rear garden. Form: 2 close growing specimens. History: Multiple pruning wounds due to crown lifting (healing slowly). Defects: No defects observed.	No action required.			Moderate Good	Low 10-20 C
								n/a 3			Good	
T14	Early-Mature Elder <i>Sambucus nigra.</i>	8	4.5	21	2 2 1		Position: Situated within the rear garden. Form: Single stemmed with a slight lean and a compact crown. History: Occasional pruning wounds due to crown lifting. Defects: No defects observed.	No action required.			Moderate Good	Low 40+ C
									n/a	3		

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) W N E S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)			Vigour	Amenity Value
								Priority	Inspect Freq (yrs)	Physiological Condition	Structural Condition	Life Expectancy (yrs) Retention Category
T15	Semi-Mature Sycamore Acer pseudoplatanus.	10	3	23	4 2 5 2		Position: Situated within the rear garden. Form: Single stemmed and leaning with a compact crown. History: No evidence of significant pruning. Defects: No defects observed. Other: Ivy prevented detailed inspection.	No action required.	3	High Good	Good	Low 40+ C
								n/a				
T16	Semi-Mature Sycamore Acer pseudoplatanus.	6	4.5	30	1 1.5 2 1		Position: Situated on third party land. Form: Twin-stemmed at 2m with a compact crown. History: Heavily reduced. Defects: No defects observed. Other: Limited inspection, dimensions estimated.	No action required.	3	Moderate Good	Good	Low 40+ C
								n/a				
T17	Semi-Mature Privet Ligustrum ovalifolium.	4	2	14	3 0 2		Position: Situated within the front garden. Form: Twin-stemmed at 0.5m with a compact crown (shrub). History: No evidence of significant pruning. Defects: No defects observed. Other: 2 stems at 8 and 12cm in diameter.	No action required.	3	Moderate Good	Good	Low 40+ C
								n/a				

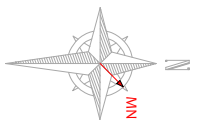


Tree Retention Categories	
 Category A tree	Tree of moderate quality with a life expectancy of 20+ years, retention of these trees desirable though less than Category A trees
 Category B tree	Tree of moderate quality with a life expectancy of 10-20 years, retention of these trees desirable though less than Category A trees
 Category C tree	Tree of moderate quality with a life expectancy of 5-10 years, retention of these trees desirable though less than Category A trees
 Category U tree	Tree unsuitable for retention due to the very poor condition.



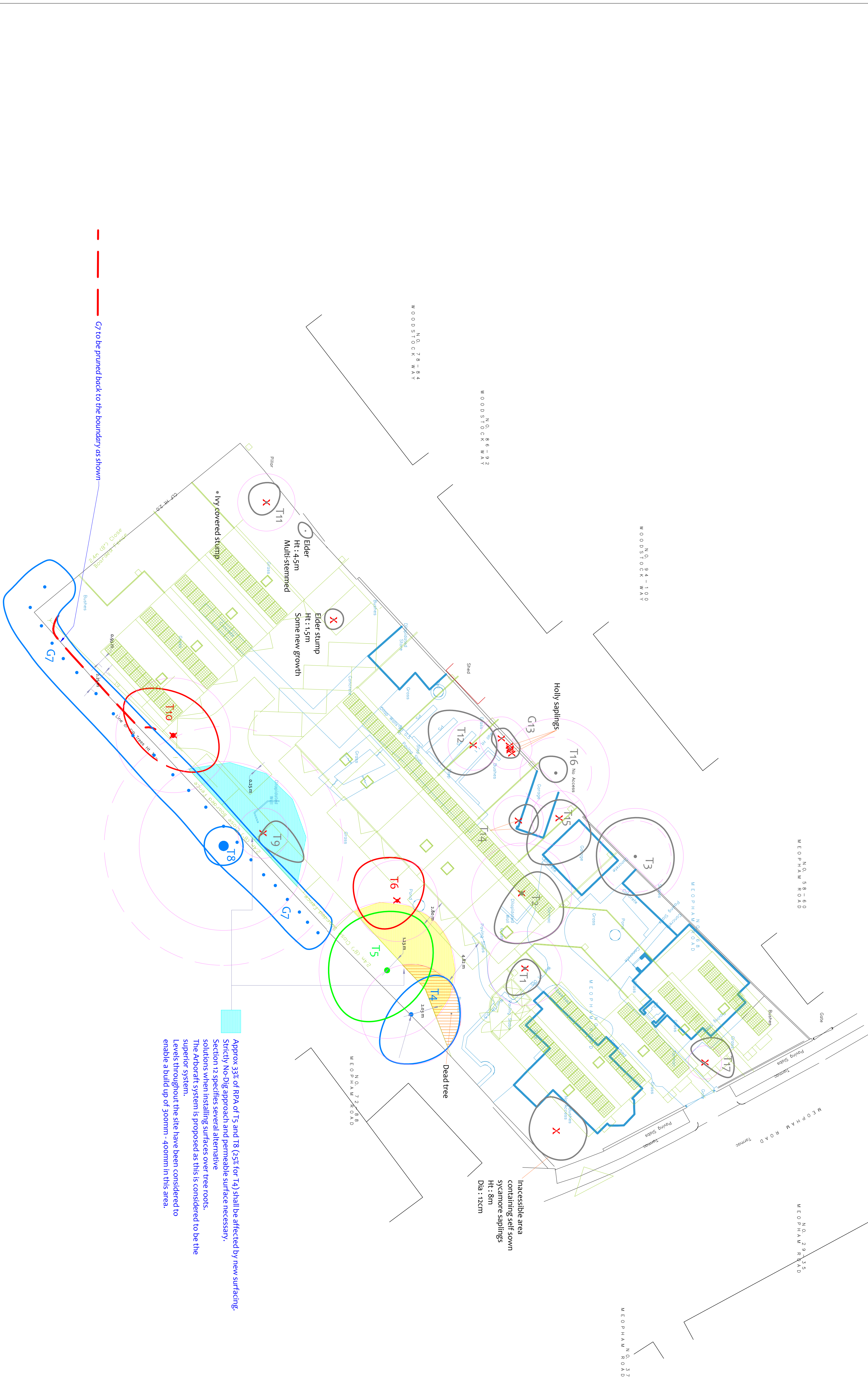
Tree Retention Categories	
 Category A tree	Tree of moderate quality with a life expectancy of 20+ years, retention of these trees desirable though less than Category A trees
 Category B tree	Tree of moderate quality with a life expectancy of 10-20 years, retention of these trees desirable though less than Category A trees
 Category C tree	Tree of moderate quality with a life expectancy of 5-10 years, retention of these trees desirable though less than Category A trees
 Category U tree	Tree unsuitable for retention due to the very poor condition.

Tree Ref.	Species	Height (m)	DBH (cm)	Notes
T1	Apple	4	3.7	43
T2	Mulberry	7	5.0	80
T3	Apple	7	5.0	80
T4	Oak	14	5.0	80
T5	Oak	14	6.8	147
T6	Apple	5	4.1	52
T7	Apple	5	4.1	52
T8	London Plane	18	12.0	452
T9	Oak	12	2.5	20
T10	Mature Cypress	14	5.8	104
T11	Apple	4	2.2	20
T12	Apple	4	2.2	20
T13	Holly	8	2.5	15
T14	Holly	8	2.5	15
T15	Sycamore	6	3.0	41
T16	Pine	4	1.7	9
T17	Pine	4	1.7	9



Impact Assessment Plan

(Existing Layout with Proposals Overlay)



Approx 33% of FPA of T5 and T8 (25% for T4) shall be affected by new surfacing. Strictly No-Dig approach and permeable surface necessary. Section 12 specifies several alternative solutions when installing surfaces over tree roots. The Arborat system is proposed as this is considered to be the superior system. Levels throughout the site have been considered to enable a build up of 300mm - 400mm in this area.

Drawing No:	CCL 09185	IAP Rev: 1
Title:	Impact Assessment Plan (Existing Layout with Proposals Overlay)	
Site:	6870 Meopham Road Oak Hill	
Scale:	0 5 10m	Page Size: A1

Arboriculture & Landscaping	
Tree Retention Categories	
Category A tree	Tree of high quality with no significant presence of any pests or diseases
Category B tree	Tree of moderate quality with a few signs of any pests or diseases
Category C tree	Tree of low quality with significant presence of any pests or diseases
Category U tree	Tree of low quality with significant presence of any pests or diseases

Tree of high quality with no significant presence of any pests or diseases	
Tree of moderate quality with a few signs of any pests or diseases	
Tree of low quality with significant presence of any pests or diseases	
Tree of low quality with significant presence of any pests or diseases	

Impact Assessment Plan

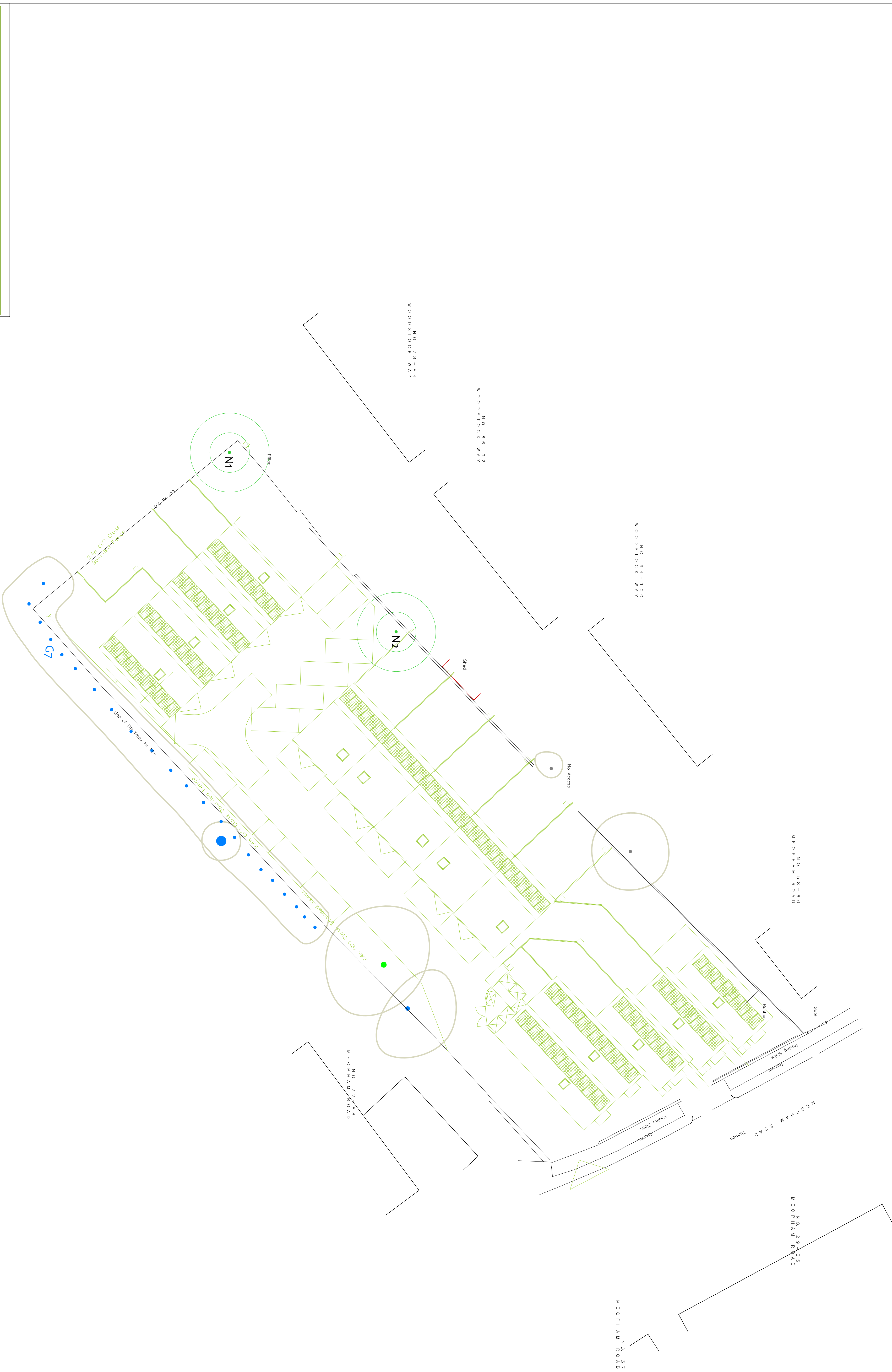
(Existing Layout with Proposals Overlay)

T1 - Tree No. 1	G2 - Group No. 2	H3 - Hedge No. 3
BS 3537 Root Protection Area (radius = 12.5m diameter)		
Root Protection Area (radius = 12.5m diameter)		
Root Protection Area (radius = 12.5m diameter)		



Tree Ref.	Species	Height (m)	DBH (cm)
T1	Apple	4	3.7
T2	Mulberry	7	5.0
T3	Oak	14	5.0
T4	Oak	14	5.0
T5	Oak	14	5.0
T6	Apple	5	4.1
T7	London Plane	12	2.5
T8	London Plane	12	2.5
T9	Oak	12	2.5
T10	London Plane	12	2.5
T11	London Plane	12	2.5
T12	London Plane	12	2.5
T13	London Plane	12	2.5
T14	London Plane	12	2.5
T15	London Plane	12	2.5
T16	London Plane	12	2.5
T17	London Plane	12	2.5





Proposed Planting Plan



Ref No	Species	N°	Size
N1	Blue Atlas Cedar <i>Cedrus atlantica f. glauca</i>	1	Heavy 12-14 cm girth, 3.5-4.5m height
N2	Purple Beech <i>Fagus sylvatica purpurea</i>	1	Heavy 12-14 cm girth, Standard 3.5m+

Drawing No:	CCL 09185	/ PLP Rev: 1
Title:	Proposed Tree Planting Plan (After Vegetation Removal)	
Site:	6870 Wakeham Road Oak Hill	
Scale:	0 5 10m Paper Size: A1	
<div><div><div>Approved for submission on 13/10/2020</div></div><div><div>Tree Retention Categories Stems & canopies shown</div></div></div> <div><div>Category A tree</div><div>Category B tree</div><div>Category C tree</div><div>Category U tree</div></div>		

Proposed Tree Planting Stems & canopies shown		Proposed new tree reference No, showing and/or (radius)	
			
BS 5357 Road Protection Area (radius = 1.25 x stem diameter)		BS 5357 Road Protection Area (radius = 1.25 x stem diameter)	
Road Protection Area is defined as the area to the conditions, e.g. presence of existing road or building		Road Protection Area is defined as the area to the conditions, e.g. presence of existing road or building	
Road Protection Area having been amended to account for all the conditions		Road Protection Area having been amended to account for all the conditions	
T1 = Tree No. 1		G2 = Group No. 2	
H3 = Hedge No. 3		H3 = Hedge No. 3	
MN = Measured North		MN = Measured North	
Canopy spreads are sometimes measured to an approximate N		Canopy spreads are sometimes measured to an approximate N	
Offshore accurate, especially where rows of trees are not aligned N-S or E-W		Offshore accurate, especially where rows of trees are not aligned N-S or E-W	

Proposed Planting Plan