



## ARBORICULTURAL IMPACT ASSESSMENT REPORT FOR:

28 Maresfield Gardens  
London  
NW3 5SX

## INSTRUCTING PARTY:

Mr and Mrs Freedman  
33 Maresfield Gardens  
London  
NW3 5SD

## REPORT PREPARED BY

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**Ref:** GWA/28MFG/AIA/01a

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**PART 1: MAIN TEXT**

<b>Section</b>	<b>Content</b>	<b>Page N°</b>
1.0	SUMMARY	4
2.0	INTRODUCTION	5
3.0	OBSERVATIONS	7
4.0	DEVELOPMENT CONSTRAINTS	9
5.0	ARBORICULTURAL IMPACTS	12
6.0	DISCUSSION	13
7.0	CONCLUSION	16
8.0	RECOMMENDATIONS	17
9.0	REFERENCES	20

**PART 2 - APPENDICES**

APPENDIX 1	Survey Data	22
APPENDIX 2	Recommended Tree Works	26
APPENDIX 3	Recommended Tree Works to Facilitate Development	28
APPENDIX 4	Trees for Urban Sites	30

**PART 3 - PLANS**

PLAN 1	Tree Constraints Plan	32
PLAN 2	Impact Assessment Plan(s)	34

## Caveats

This report is primarily an arboricultural report. Whilst comments relating to matters involving built structures or soil data may appear, any opinion thus expressed should be viewed as qualified, and confirmation from an appropriately qualified professional sought. Such points are usually clearly identified within the body of the report. It is not a full safety survey or subsidence risk assessment survey. These services can be provided but a further fee would be payable. Where matters of tree condition with a safety implication are noted during a survey they will of course appear in the report.

A tree survey is generally considered invalid in planning terms after 2 years, but changes in tree condition may occur at any time, particularly after acute (e.g. storm events) or prolonged (e.g. drought) environmental stresses or injuries (e.g. root severance). Routine surveys at different times of the year and within two - three years of each other (subject to the incidence of the above stresses) are recommended for the health and safety management of trees remote from highways or busy access routes. Annual surveys are recommended for the latter.

Tree works recommendations are found in the Appendices to this report. It is assumed, unless otherwise stated ("ASAP" or "Option to") that all husbandry recommendations will be carried out within 6 months of the report's first issue. Clearly, works required to facilitate development will not be required if the application is shelved or refused. However, necessary husbandry work should not be shelved with the application and should be brought to the attention of the person responsible, by the applicant, if different. Under the Occupiers Liability Act of 1957, the owner (or his agent) of a tree is charged with the due care of protecting persons and property from foreseeable damage and injury.' He is responsible for damage and/or nuisance arising from all parts of the tree, including roots and branches, regardless of the property on which they occur. He also has a duty under The Health and Safety at Work Act 1974 to provide a safe place of work, during construction. Tree works should only be carried out with local authority consent, where applicable.

Inherent in a tree survey is assessment of the risk associated with trees close to people and their property. Most human activities involve a degree of risk, such risks being commonly accepted if the associated benefits are perceived to be commensurate.

Risks associated with trees tend to increase with the age of the trees concerned, but so do many of the benefits. It will be appreciated, and deemed to be accepted by the Instructing Party, that the formulation of recommendations for all management of trees will be guided by the cost-benefit analysis (in terms of amenity), of tree work that would remove all risk of tree related damage.

Prior to the commencement of any tree works, an ecological assessment of specific trees may be required to ascertain whether protected species (e.g. bats, badgers and invertebrates etc.) may be affected.

## 1.0 SUMMARY

<b>Instructing Party:</b>	Mr and Mrs Freedman	<b>Case Ref:</b>	GWA/28MFG/AIA/01
<b>Local Authority:</b>	LB Camden	<b>Date:</b>	19/08/16
Site Address: 28 Maresfield Gardens, London NW3 5SX			
Proposal: Various, including provision of new basement level, rear extension and internal alterations			
<b>Report Checklist</b>	<b>Y/N</b>		<b>Y/N</b>
Arboricultural constraints on site	Y	Trees removal proposed	Y
Tree Survey	Y	Topographical Survey	Y
BS5837 Report	Y	Conservation Area	Y
Tree Preservation Orders	N/k		
Tree Protection Plan:	N/a	(Include in future method statement)	
Tree Constraints Plan:	Y		
Arboricultural Impact Assessment:	Y		
<b>Site Layout</b>			
Site Visit	Y	Date: 08/06/16	Access Full/Partial/None
			F/P
Trees on Site	Y	Off-site Trees	Y
Trees affected by development	Y	O/s trees affected by development	N
Tree replacement proposed:	Y	On or off-site trees indirectly affected by development	N
<b>Trees with the potential to be affected</b>			
Felling of category C T15 rated as low impact due to low quality, indifferent condition and limited remaining life expectancy of tree – replacement planting proposed as mitigation.			
Minor encroachment of RPA of T14 by LGF level patio, bounding half-wall and steps to garden level rated as low impact – manual excavation in conjunction with pre-emptive root pruning proposed as mitigation.			
<b>Comments</b>			
Recommended works for 1 off-site tree regardless of development, but also pertinent to maintaining a safe work site.			
<b>Recommendations</b>			
1	Proposal will mean the loss of important trees (TPO/CA)		N
2	Proposal has sufficient amelioration for tree loss		Y
3	Proposals provide adequate tree protection measures		Y
4	Proposal will mean retained trees are too close to buildings		N
5	Specialist demolition / construction techniques required		Y
6	The Proposal will result in significant root damage to retained trees		N
7	Further investigation of tree condition recommended		Y

RPA= Root Protection Area

TPP= Tree Protection Plan

AMS= Arboricultural Method Statement

AIA = Arboricultural Implication Assessment

BS5837: 2012 'Trees in relation to design, demolition and construction – Recommendations'

Arboricultural Impact Assessment Report: 28 Maresfield Gardens, London NW3 5SX

Instructing party:: Mr and Mrs Freedman, 33 Maresfield Gardens, London NW3 5SX

Prepared by: Adam Hollis of Landmark Trees, Holden House, 4th Floor, 57 Rathbone Place, London W1T 4JU

## 2. INTRODUCTION

### 2.1 Terms of Reference

- 2.1.1 LANDMARK TREES were asked by Mr and Mrs Freedman to provide a survey and an arboricultural impact assessment of proposals for the site: 28 Maresfield Gardens, London NW3 5SX. The report is to accompany a planning application.
- 2.1.2 The proposals are for the excavation of a basement and construction of a lower ground floor extension to the rear; improvements to the roof and fenestration including the addition of a dormer window; improvements to elevational treatment and hard and soft landscaping work.
- 2.1.3 This report will assess the impact on the trees and their constraints, identified in our survey. Although the proposals were known at the time of the survey, Landmark Trees endeavour to survey each site blind, working from a topographical survey, wherever possible, with the constraints plan informing their evolution.
- 2.1.4 I am a Registered Consultant and Fellow of the Arboricultural Association and a Chartered Forester, with a Masters Degree in Arboriculture and 25 years' experience of the landscape industry - including the Forestry Commission and Agricultural Development and Advisory Service. I am a UK Registered Expert Witness, trained in single and joint expert witness duties. I am also Chairman of the UK & I Regional Plant Appraisal Committee, inaugurated to promote international standards of valuation in arboriculture.

### 2.2 Drawings Supplied

- 2.2.1 The drawings supplied by the Instructing Party and relied upon by Landmark Trees in the formulation of our survey plans are:
- Existing site survey: Planning Existing Drawings\*
- Proposals: Planning Proposed Drawings

\*In the absence of a full topographical survey, tree positions may be approximate only.

## 2.3 Scope of Survey

- 2.3.1 As Landmark Trees' (LT) arboricultural consultant, Vince Cainey surveyed the trees on site on 8<sup>th</sup> June 2016, recording relevant qualitative data in order to assess both their suitability for retention and their constraints upon the site, in accordance with British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations [BS5837:2012].
- 2.3.2 Our survey of the trees, the soils and any other factors, is of a preliminary nature. The trees were SURVEYED on the basis of the Visual Tree Assessment method expounded by Mattheck and Breloer (The Body Language of Trees, DoE booklet Research for Amenity Trees No. 4, 1994). LT have not taken any samples for analysis and the trees were not climbed, but inspected from ground level.
- 2.3.3 A tree survey is generally considered invalid in planning terms after 2 years, but changes in tree condition may occur at any time, particularly after acute (e.g. storm events) or prolonged (e.g. drought) environmental stresses or injuries (e.g. root severance). Routine surveys at different times of the year and within two - three years of each other (subject to the incidence of the above stresses) are recommended for the health and safety management of trees remote from highways or busy access routes. Annual surveys are recommended for the latter.
- 2.3.4 The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

## 2.4 Survey Data & Report Layout

- 2.4.1 Detailed records of individual trees are given in the survey schedule in Appendix 1 to this report. General husbandry recommendations are distinguished at Appendix 2 from the minimum requirements to facilitate development / form part of the planning application at Appendix 3. The former may still be relevant to providing a safe site of work, of course. Similarly, if for whatever reason the development does not go ahead, our recommendations in Appendix 2 would still apply.
- 2.4.2 A site plan identifying the surveyed trees, based on the Instructing Party's drawings / topographical survey is provided in Part 3 of this report.
- 2.4.3 This plan also serves as the Tree Constraints Plan with the theoretical Recommended Protection Areas (RPA's), tree canopies and shade constraints, (from BS5837: 2012) overlain onto it. These constraints are then overlain in turn onto the Instructing Party's proposals to create a second Arboricultural Impact Assessment Plan in Part 3. General observations and discussion follow, below.

### 3.0 OBSERVATIONS

#### 3.1 Site Description



Photograph 1: 28 Maresfield Gardens, London NW3 5SX (Source: Google Maps)

- 3.1.1 This property is located in the Frognal and Fitzjohns Ward within the Fitzjohns and Netherhall Conservation Area of the London Borough of Camden. It comprises a 6 bedroom detached house with large rear gardens. The lower ground floor level consists of the kitchen and study and opens out to the patio which is approximately 600mm lower than the garden.
- 3.1.2 There are a number of significant level changes within the rear garden, as detailed above.
- 3.1.3 In terms of the British Geological Survey, the site overlies the London Clay Formation (see indicated location on Fig.1 plan extract below). The associated soils are generally, highly shrinkable clay; e.g. slowly permeable seasonally waterlogged fine loam over clay. Such highly plastic soils are prone to movement: subsidence and heave. The actual distribution of the soil series are not as clearly defined on the ground as on plan and there may be anomalies in the actual composition of clay, silt and sand content.
- 3.1.4 Clay soils are prone to compaction during development with damage to soil structure potentially having a serious impact on tree health. The design of foundations near problematic tree species will also need to take into consideration subsidence risk. Further advice from the relevant experts on the specific soil properties can be sought as necessary.

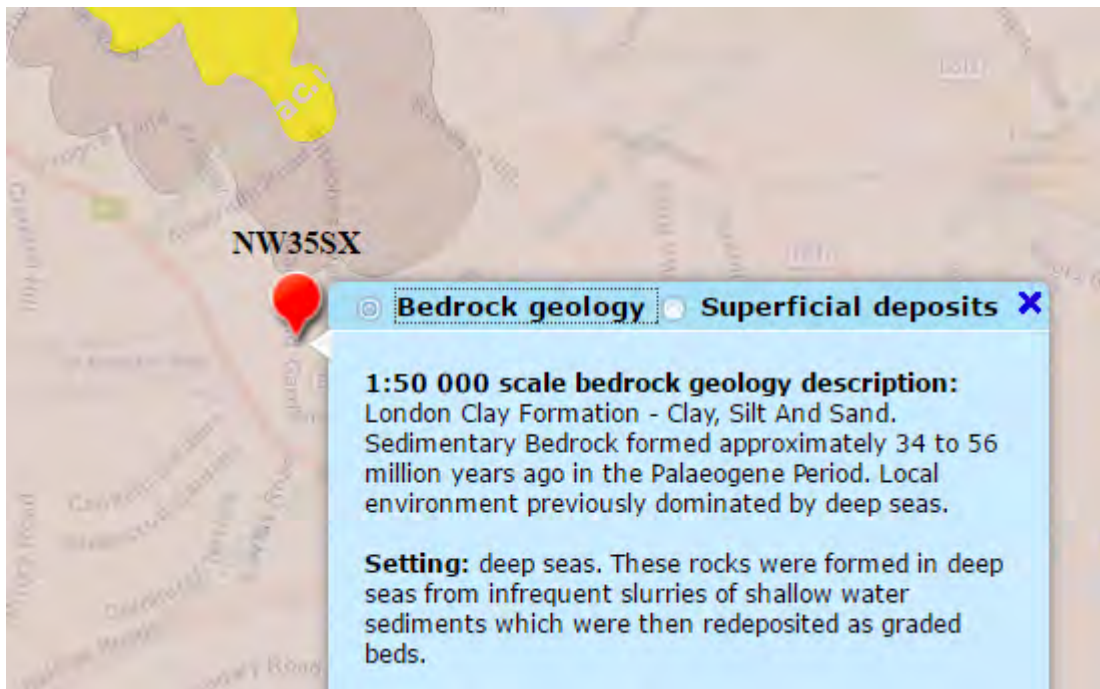


Figure 1: Extract from the BGS Geology of Britain Viewer

### 3.2 Subject Trees

- 3.2.1 Of the 16 surveyed trees none are A category \*(High Quality), 2 are B category \*(Moderate Quality), 14 are C category \*(Low Quality) and none are U category \*(Unsuitable for Retention).
- 3.2.2 The tree species found on site comprise Myrobalan plum, apple, Lawson cypress, Judas tree, holly, saucer magnolia, Leyland cypress and London plane.
- 3.2.3 In terms of age demographics there is a preponderance of mature and semi-mature trees on the site with no young or early mature trees present.

3.2.4 Full details of the surveyed trees can be found in Appendix 1 of this report.

3.2.5 There are recommended works for 1 off-site tree (T16 – third party tree). These are listed in Appendix 2.

### 3.3 Planning Status

- 3.3.1 We are not aware of the existence of any Tree Preservation Orders (TPO) on the site. However, as noted at paragraph 3.1.1, the site is located in a Conservation Area. In accordance with Section 211 of the Town and Country Planning Act 1990 (as amended), any tree over 75mm in diameter at 1.5m above ground level on the site is given automatic protection as if it benefited from a TPO. It is a criminal offence to prune, damage or fell such trees without permission from the local planning authority.



## 4.0 DEVELOPMENT CONSTRAINTS

### 4.1 Primary Constraints

- 4.1.1 BS5837: 2012 gives Recommended Protection Areas (RPA's) for any given tree size. The individual RPA's are calculated in the Tree Schedule in Appendix 1 to this report, or rather the notional radius of that RPA, based on a circular protection zone. The prescribed radius is 12-x stem diameter at 1.5m above ground level, except where composite formulae are used in the case of multi-stemmed trees.
- 4.1.2 Circular RPA's are appropriate for individual specimen trees grown freely, but where there is ground disturbance, the morphology of the RPA can be modified to an alternative polygon, as shown in the diagram below (Figure 2). Alternatively, one need principally remember that RPA's are area-based and not linear – notional rather than fixed entities.

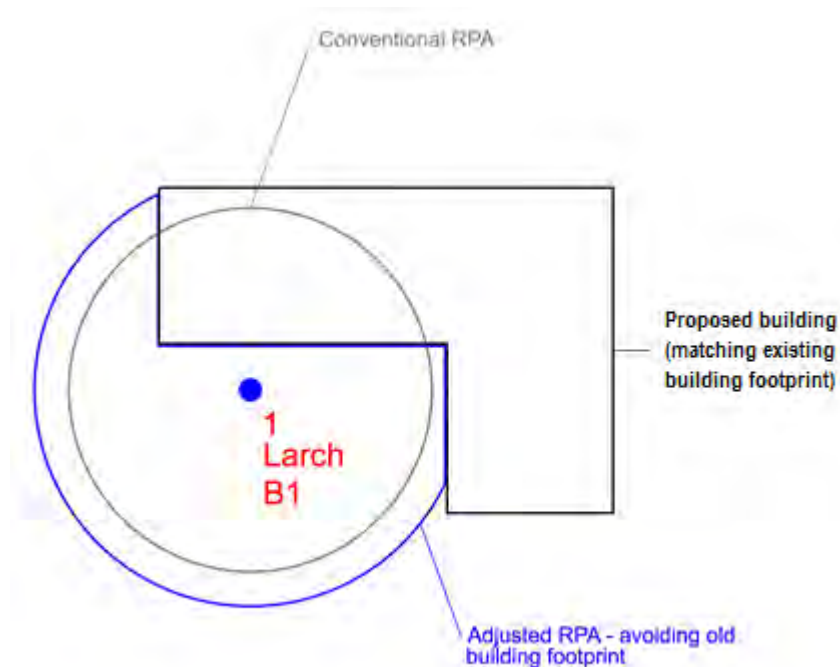


Figure 2 – Generic BS 5837 RPA Adjustments

- 4.1.3 In BS5837, paragraph 4.6.2 states that RPA's should reflect the morphology and disposition of the roots; where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution.
- 4.1.4 **No *a priori* modifications have been made in this instance, though further investigations are recommended, where the proposals encroach / come near RPA and their modification could have a bearing on the impact assessment.**

- 4.1.5 The quality of trees will also be a consideration: U Category trees are discounted from the planning process in view of their limited service life. Again, Category-C trees would not normally constrain development individually, unless they provide some external screening function.
- 4.1.6 At paragraph 5.1.1. BS5837: 2012 notes that “Care should be exercised over misplaced tree preservation; attempts to retain too many or unsuitable trees on a site are liable to result in excessive pressure on the trees during demolition or construction work, or post-completion demands on their removal.”

4.1.7 In theory, only moderate quality trees and above are significant material constraints on development. However, the low quality trees would comprise a constraint in aggregate, in terms of any collective loss / removal, where replacement planting would be appropriate, though no such collective impact is proposed.

4.1.8 In this instance, whilst the moderate quality trees have the potential to pose significant constraints to development, their location at the extreme front and rear of the site means that these constraints are significantly lessened, provided it is not necessary to develop up to the boundaries of the site.

## 4.2 Secondary Constraints

4.2.1 The second type of constraint produced by trees that are to be retained is that the proximity of the proposed development to the trees should not threaten their future with ever increasing demands for tree surgery or felling to remove nuisance shading (Figure 3), honeydew deposition or perceived risk of harm.



Figure 3 –  
Generic Shading Constraints

4.2.2 The shading constraints are crudely determined from BS5837 by drawing an arc from northwest to east of the stem base at a distance equal to the height of the tree, as shown in the diagram opposite. Shade is less of a constraint on non-residential developments, particularly where rooms are only ever temporarily occupied.

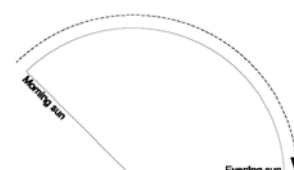


Figure 4 – Shading Arc

4.2.3 This arc (see Figure 4) represents the effects that a tree will have on layout through shade, based on shadow patterns of 1x tree height for a period May to Sept inclusive 10.00-18.00 hrs daily.

4.2.4 Assuming that they will be retained, the orientation of the on-site trees will ensure that shading constraints are minimal, with leaf deposition and honey-dew likely to be as it is today.

*Note: Sections 5 & 6 will now assess the impacts upon constraints identified in Section 4. Table 1 in Section 5 presents the impacts in tabular form (drawing upon survey data presented in Appendices 1 & 2). Impacts are presented in terms of whole tree removal and the effect on the landscape or partial encroachment (% of RPA) and its effect on individual tree health. Section 6 discusses the table data, elaborating upon the impacts' significance and mitigation.*

## Table 1: Arboricultural Impact Assessment

(Impacts assessed prior to mitigation and rated with reference to Matheny & Clark (1998))



Ref: GWA\_28MFG\_AIA

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
C	14	Plum, Myrobalan	Patio Construction within RPA at LGF Level  Wall Construction within RPA	1.6 m <sup>2</sup> 3.45 %	Mature	Moderate	Moderate	Low	Low	Airspade / manual excavation
C	15	Plum, Myrobalan	Felled to Facilitate Development	m <sup>2</sup> N/A %	Mature	Moderate	N/A	N/A	Low	New planting / landscaping

## 6.0 DISCUSSION

### 6.1 Rating of Primary Impacts

- 6.1.1 The principal impacts in the current proposals are the removal of the Myrobalan plum T15 from within the rear garden. The loss of this low quality, interior site tree is rated as a low impact subject to the proposed mitigation of replacement planting. The somewhat indifferent condition of the tree and concomitant limited remaining life expectancy further reduce the impact of its removal.
- 6.1.2 Further impacts to retained trees comprise the encroachments of the theoretical RPA of T14 by the extension of the patio area and bounding half-wall and steps to the garden level. As the patio extension is at the LGF level, manual excavation of the encroachment in conjunction with pre-emptive root pruning is proposed as mitigation. Subject to the adoption of these measures, the impact to the tree is likely to be very low.
- 6.1.3 The replanting scheme will offer considerable enhancement and replaces a tree with limited remaining life expectancy. Replacement trees will have the advantage of being specifically selected for the proposed site, healthy and fit-for-purpose. Design can provide for a diverse range of native and ornamental species that will compliment rather than conflict with the proposals, so providing a more sustainable long-term resource for the future.

- 6.1.4 The principal of RPA encroachment is established within BS5837:2012 and supported by the source document, National Joint Utilities Guidelines 10 / Vol. 4 1995 / 2010. NJUG introduced the x12 diameter *Precautionary Zone* for supervised working and *Prohibited Zone* at a universal 1m from the base of the tree. RPA's are frequently confused with the NJUG Prohibited Zone, when they clearly correlate with the NJUG Precautionary Zone.
- 6.1.5 An RPA encroachment of <20% of RPA may be considered as low impact, given the permissive references to 20% RPA relocation and impermeable paving within BS5837:2012 and other published references to healthy trees tolerating up to 30-50% root severance (Coder, Helliwell and Watson in CEH 2006). The trees in question are healthy specimens of species with a good resistance to development impacts, and quite capable of tolerating these low impacts.
- 6.1.6 **"In practice 50% of roots can sometimes be removed with little problem**, provided there are vigorous roots elsewhere. Inevitably, this degree of root loss will temporarily slow canopy growth and even lead to some dieback" (Thomas 2000). LT do not recommend annexing such high proportions of the root system; rather that within the context of the published science, planning should not be unduly concerned by impacts that are well below the subcritical threshold – *tree health is not at stake*.

6.1.7 BS5837 recommends (at 5.3.a) that if operations within the RPA are proposed, the project arboriculturist should demonstrate that the tree(s) can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA. On the basis of Thomas et al, above, it is possible to demonstrate that the tree can remain viable, and on the basis that the tree will be rooting no less freely in the garden / lawn / border / pavement than within the proposed footprint, with the RPA encroachment compensated elsewhere on contiguous land. The guide also recommends (at 5.3.b) the arboriculturist propose a series of mitigation measures (to improve the soil environment that is used by the tree for growth). These are provided at 6.3 below.

## 6.2 Rating of Secondary Impacts

6.2.1 There will always be marginal secondary impacts of honeydew / litter deposition and partial shade on this site, regardless of development. The status quo is unlikely to change with further development, which is the salient point for planning to consider. Thus, the secondary impacts of development are minimal.

## 6.3 Mitigation of Impacts

6.3.1 All plant and vehicles engaged in excavation works should either operate outside the RPA, or should run on a temporary surface designed to protect the underlying soil structure.

6.3.2 The limits of excavation within RPAs will be undertaken manually; any roots encountered will be cleanly pruned back to an appropriate junction with a sharp pruning saw or secateurs. Roots larger than 25mm diameter may only be cut in consultation with an arboriculturist.

6.3.5 Nuisance deposition can be further mitigated with routine maintenance, light pruning / deadwooding and the fitting of filtration traps on guttering (see Figure 5 below).

6.3.6 The landscape impact of tree losses can be offset by the landscape proposals, ideally involving new planting of ornamental varieties of native species, and where appropriate with columnar or compact form. A selection of columnar tree species cultivars for constricted sites is provided in Appendix 4.

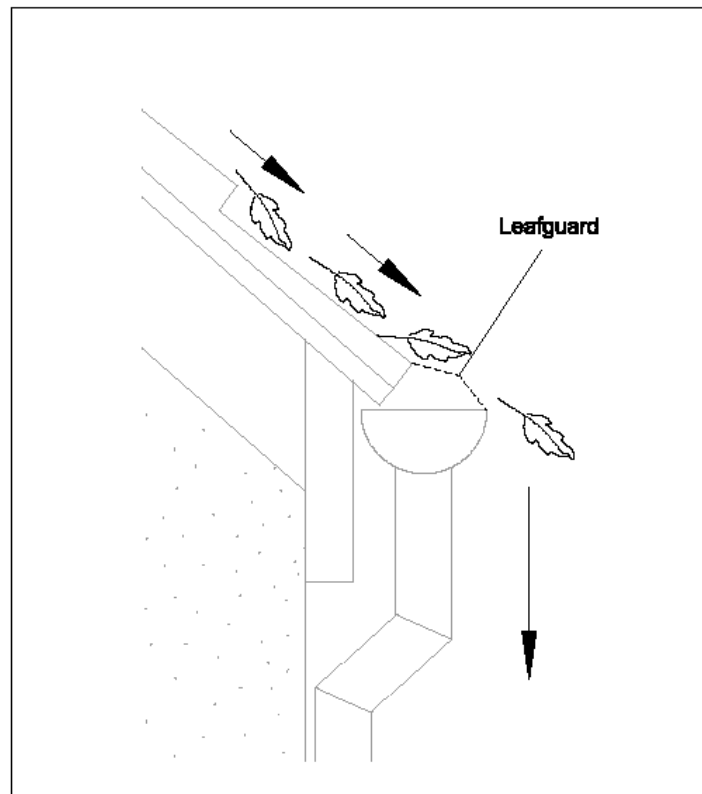


Figure 5: Filtration traps, as shown above, could be fitted on the gutters which can easily be maintained at 2-3m above ground.

## 7.0 CONCLUSION

- 7.1 The potential impacts of development are all relatively low in terms of both quality of trees removed and also RPA encroachments of trees retained.
- 7.2 The full potential of the impacts can be largely mitigated through design and precautionary measures. These measures can be elaborated in Method Statements in the discharge of planning conditions.
- 7.3 The species affected are generally tolerant of root disturbance / crown reduction and the retained trees are generally in good health and capable of sustaining these reduced impacts.
- 7.4 The trees that are recommended for felling are of little individual significance, such that their loss will not affect the visual character of the area.
- 7.5 Therefore, the proposals will not have any significant impact on either the retained trees or wider landscape. Thus, with suitable mitigation and supervision the scheme is recommended to planning.



## 8.0 RECOMMENDATIONS

### 8.1 Specific Recommendations

- 8.1.1 Current tree works recommendations are found in Appendix 2 to this report, with works to facilitate development in Appendix 3 and a selection of columnar tree species cultivars for constricted sites provided in Appendix 4. Any tree removals recommended within this report should only be carried out with local authority consent.
- 8.1.2 Excavation and construction impacts within the RPA's of trees identified in Table 1 above, will need to be controlled by method statements specifying mitigation methods suggested in para 6.3 above and by consultant supervision as necessary. These method statements can be provided as part of the discharge of conditions.
- 8.1.3 Replace felled trees T15 with 1 x native ornamental 14-16 cm girth nursery stock under current best practice; i.e. conforming to and planted in accordance with the following:

- BS8545: 2014 Code of Practice for Trees from Nursery to Landscape
- BS 3936:1980 Nursery Stock;
- BS 4043:1966 Transplanting Semi-Mature Trees; and
- BS 5236:1975 Cultivation and Planting of Trees in the Advanced Nursery Stock Category.
- All replacement stock should be planted and maintained as detailed in BS 4428:1989 (Section 7): Recommendations for General Landscape Operations.

## 8.2 General Recommendations for Sites Being Developed with Trees

- 8.2.1 Any trees which are in close proximity to the proposed development should be protected with a Tree Protection Barrier (TPB). Protective barrier fencing should be installed immediately following the completion of the tree works, remaining in situ for the entire duration of the development unless otherwise agreed in writing by the Council. It should be appropriate for the intensity and proximity of the development, usually comprising steel, mesh panels 2.4m in height ('Heras') and should be mounted on a scaffolding frame (shown in Fig 2 of BS5837:2012). The position of the TPB can be shown on plan as part of the discharge of conditions, once the layout is agreed with the planning authority. The TPB should be erected prior to commencement of works, remain in its original form on-site for the duration of works and be removed only upon full completion of works.
- 8.2.2 A TPB may no longer be required during soft landscaping work but a full arboricultural assessment must be performed prior to the undertaking of any excavations within the RPA of a tree. This will inform a decision about the requirement of protection measures. It is important that all TPBs have permanent, weatherproof notices denying access to the RPA.
- 8.2.3 The use of heavy plant machinery for building demolition, removal of imported materials and grading of surfaces should take place in one operation. The necessary machinery should be located above the existing grade level and work away from any retained trees. This will ensure that any spoil is removed from the RPAs. It is vital that the original soil level is not lowered as this is likely to cause damage to the shallow root systems.
- 8.2.4 Any pruning works must be in accordance with British Standard 3998:2010 Tree work [BS3998].
- 8.2.5 Where sections of hard surfacing are proposed in close proximity to trees, it is recommended that "No-Dig" surfacing be employed in accordance with BS5837:2012 and 'The Principles of Arboricultural Practice: Note 1, Driveways Close to Trees, AAIS 1996 [APN1]'.
- 8.2.6 If the RPA of a tree is encroached by underground service routes then BS5837:2012 and NJUG VOLUME 4 provisions should be employed. If it is deemed necessary, further arboricultural advice must be sought.
- 8.2.7 Numerous site activities are potentially damaging to trees e.g. parking, material storage, the use of plant machinery and all other sources of soil compaction. In operating plant, particular care is required to ensure that the operational arcs of excavation and lifting machinery, including their loads, do not physically damage trees when in use.

- 8.2.8 To enable the successful integration of the proposal with the retained trees, the following points will need to be taken into account:
- 1) Plan of underground services.
  - 2) Schedule of tree protection measures, including the management of harmful substances.
  - 3) Method statements for constructional variations regarding tree proximity (e.g. foundations, surfacing and scaffolding).
  - 4) Site logistics plan to include storage, plant parking/stationing and materials handling.
  - 5) Tree works: felling, required pruning and new planting. All works must be carried out by a competent arborist in accordance with BS3998.
  - 6) Site supervision: the Site Agent must be nominated to be responsible for all arboricultural matters on site. This person must:
    - be present on site for the majority of the time;
    - be aware of the arboricultural responsibilities;
    - have the authority to stop work that is causing, or may cause harm to any tree;
    - ensure all site operatives are aware of their responsibilities to the trees on site and the consequences of a failure to observe these responsibilities;
    - make immediate contact with the local authority and/or a retained arboriculturalist in the event of any tree related problems occurring.
- 8.2.9 These points can be resolved and approved through consultation with the planning authority via their Arboricultural Officer.
- 8.2.10 The sequence of works should be as follows:
- i) initial tree works: felling, stump grinding and pruning for working clearances;
  - ii) installation of TPB for demolition & construction;
  - iii) installation of underground services;
  - iv) installation of ground protection;
  - v) main construction;
  - vi) removal of TPB;
  - vii) soft landscaping.

## 9.0 REFERENCES

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## PART 2 – APPENDICES

## APPENDIX 1

### TREE SCHEDULE

#### Botanical Tree Names

Apple	: Malus sp	Judas Tree	: Cercis siliquastrum
Cypress, Lawson	: Chamaecyparis lawsonia	Magnolia, Saucer	: Magnolia × soulangeana
Cypress, Leyland	: Cupressus × leylandii	Plane, London	: Platanus acerifolia
Holly, Common/English	: Ilex aquifolium	Plum, Myrobalan	: Prunus cerasifera

#### Notes for Guidance:

1. Height describes the approximate height of the tree measured in metres from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in metres of crown clearance above adjacent ground level.
4. Stem Diameter (Dm) is the diameter of the stem measured in millimetres at 1.5m from ground level for single stemmed trees. BS 5837:2012 formula (Section 4.6) used to calculate diameter of multi-stemmed trees. Stem Diameter may be estimated where access is restricted and denoted by '#'.
5. Protection Multiplier is 12 and is the number used to calculate the tree's protection radius and area
6. Protection Radius is a radial distance measured from the trunk centre.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak), Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remediable defects), Poor - Major defects present.
9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to (British Standard 5837:2012 section 4.5) and refers to tree/group quality and value; 'A' – High, 'B' - Moderate, 'C' - Low, 'U' - Unsuitable for retention. The following colouring has been used on the site plans:
 

█	High Quality (A) (Green),
█	Moderate Quality (B) (Blue),
█	Low Quality (C) (Grey),
█	Unsuitable for Retention (U) (Red)
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.



Site: 28 Maresfield Gardens

Date: 08/06/16

## Appendix 1

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Vince Cainey

Ref: GWA\_28MFG\_AIA

### BS5837 Tree Constraints Survey Schedule

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
1	Plum, Myrobalan	12	3434	1.0	220	Mature	2.6	Normal	Good	C	2	>40	In neighbouring property, measurements estimated.
2	Apple, Cultivated	3	2222	1.0	156	Semi-mature	1.9	Normal	Good	C	2	>40	
3	Apple, Cultivated	2.3	1011	1.0	112	Semi-mature	1.3	Normal	Good	C	2	>40	
4	Apple, Cultivated	3	2122	1.0	158	Semi-mature	1.9	Normal	Good	C	2	>40	
5	Apple, Cultivated	5	4242	2.0	220	Mature	2.6	Moderate	Fair	C	2	>40	leans to the north west.
6	Plum, Myrobalan	7	0533	2.0	430	Mature	5.2	Moderate	Fair	C	2	>40	Overhangs school playground.



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## BS5837 Tree Constraints Survey Schedule

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
7	Cypress, Lawson	12	2222	1.0	325	Mature	3.9	Normal	Good	B	2	20+	
8	Judas Tree	6	0043	2.0	200	Mature	2.4	Normal	Good	C	2		Growing close to eucalyptus.
10	Holly	7	1111	2.0	122	Semi-mature	1.5	Normal	Good	C	2	>40	
11	Magnolia, Saucer	8	3143	2.0	226	Mature	2.7	Moderate	Fair	C	2	20+	Leaf/shoot disorders
12	Cypress, Leyland	4	2222	0.0	220	Mature	2.6	Normal	Good	C	2	20+	Part of a hedge made up of 13 stems.
13	Plum, Myrobalan	9	2222	1.0	300	Mature	3.6	Moderate	Fair	C	2	20+	Inaccessible behind hedge, measurements estimated.





Site: 28 Maresfield Gardens

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## Appendix 1

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### BS5837 Tree Constraints Survey Schedule

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
14	Plum, Myrobalan	9	2332	1.0	320	Mature	3.8	Moderate	Fair	C	2	20+	Inaccessible behind hedge, measurements estimated.
15	Plum, Myrobalan	9	3325	1.0	360	Mature	4.3	Moderate	Fair	C	2	20+	Inaccessible behind hedge, measurements estimated.
16	Plane, London	13	4444	6.0	1030	Mature	12.4	Moderate	Fair	C	2	10+	Decay in trunk Recently pollarded
17	Plane, London	15	5555	8.0	965	Mature	11.6	Normal	Good	B	2	>40	pollard

## APPENDIX 2

### RECOMMENDED TREE WORKS

#### Notes for Guidance:

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

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

\*Not generally specified following BS3998:2010



Site: 28 Maresfield Gardens

Date: 08/06/16

Surveyor(s): Vince Cainey

Ref: GWA\_28MFG\_AIA

## Appendix 2

### Recommended Tree Works

[Hide irrelevant](#)  
[Show All Trees](#)

Landmark Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
16	Plane, London	C	13	6.0	4444	(Flv) Council's responsibility	Decay in trunk Recently pollarded Recommended husbandry 2

## APPENDIX 3

### RECOMMENDED TREE WORKS TO FACILITATE DEVELOPMENT (See Table 1)

#### Notes for Guidance:

- RP - Pre-emptive root pruning of foundation encroachments under arboricultural supervision.
- CB - Cut Back to boundary/clear from structure.
- CL# - Crown Lift to given height in meters.
- CT#% - Crown Thinning by identified %.
- CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs)\*.
- CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
- DWD - Remove deadwood.
- Fell - Fell to ground level.
- FInv - Further Investigation (generally with decay detection equipment).
- Pol - Pollard or re-pollard.
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- Svr Ivy /
- Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

\*Not generally specified following BS3998:2010



Landmark Trees

Site: 28 Maresfield Gardens

Date: 08/06/16

### Appendix 3

Surveyor(s): Vince Caaney

Ref: GWA\_28MFG\_AIA

## Recommended Tree Works To Facilitate Development

Hide irrelevant

Show All Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
15	Plum, Myrobalan	C	9	1.0	3325	Fell	Inaccessible behind hedge, measurements estimated. To facilitate development

## APPENDIX 4

### TREE SELECTION FOR URBAN LOCATIONS

Table A4.1: Small Ornamental Tree Species

Common Name	Species	(Columnar Form for discrete usage)
Hawthorn	<i>Crataegus monogyna</i>	Stricta
Cockspur	<i>Crataegus prunifolia</i>	Splendens
Cherry	<i>Prunus x hillieri</i>	Spire
Bird cherry	<i>Prunus padus</i>	Albertii
Rowan / Mountain ash	<i>Sorbus aucuparia</i>	Cardinal Royal
Swedish whitebeam	<i>Sorbus intermedia</i>	Brouwers
B. whitebeam	<i>Sorbus x thuringiaca</i>	Fastigiata

Table A4.2: Medium Specimen Tree Species

Common Name	Species	(Columnar Form for discrete usage)
Chinese red bark birch	<i>Betula albosinensis</i>	Fascination
Mongolian lime	<i>Tilia mongolica</i>	
Hornbeam	<i>Carpinus betulus</i>	Fastigiata Frans Fontaine
Turkish hazel	<i>Corylus columna</i>	
Maidenhair tree	<i>Gingko biloba</i>	
Pride of India	<i>Koelreuteria paniculata</i>	Fastigiata
European larch	<i>Larix decidua</i>	Sheerwater Seedling
Tulip tree	<i>Liriodendron tulipifera</i>	Fastigiata

Table A4.3: Larger Specimen Tree Species

Common Name	Species	(Columnar Form for discrete usage)
English oak	<i>Quercus robur</i>	f. Koster
American elm	<i>Ulmus americana</i> Princeton	
Cedar of Lebanon	<i>Cedrus libani</i>	



Landmark Trees

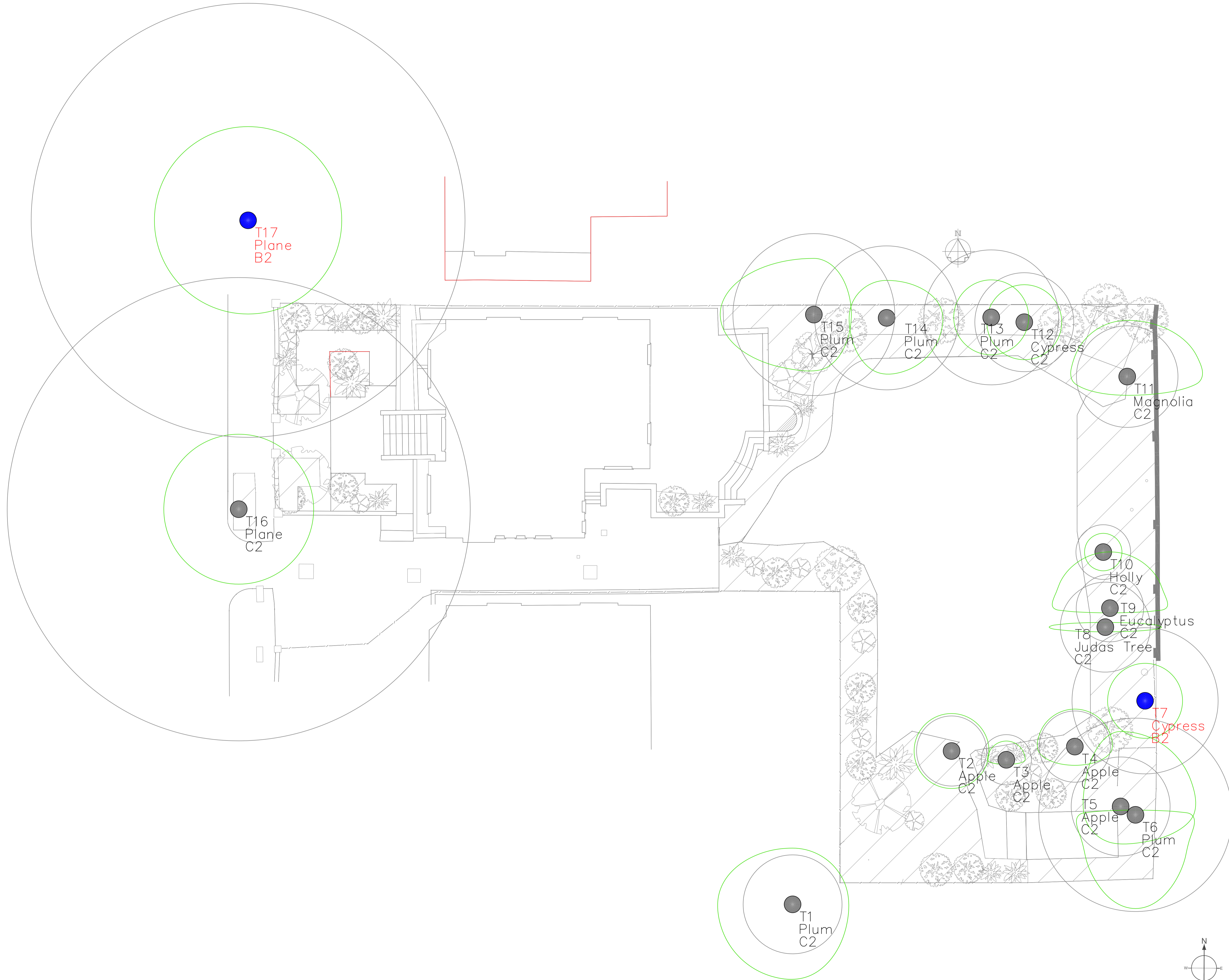
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## PART 3 – PLANS

## PLAN 1

### TREE CONSTRAINTS PLAN





**NOTE:**  
 This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.  
 Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.  
 Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

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

Site: 28 Maresfield  
 Drawing Title: Tree Constraints Plan  
 1:100@ A1  
 August 2016

**Key:**

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention

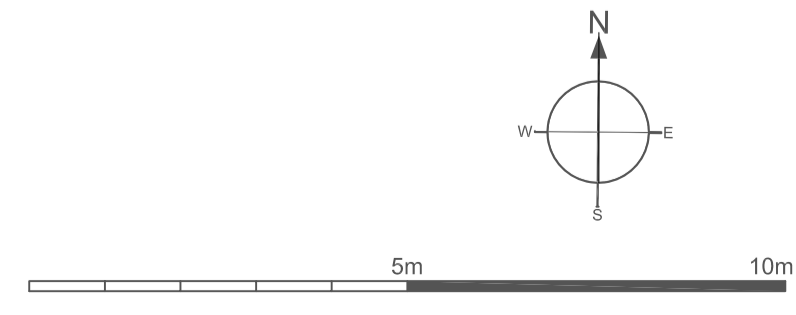
Category: Crown Spread

Tree Number

Species

Category

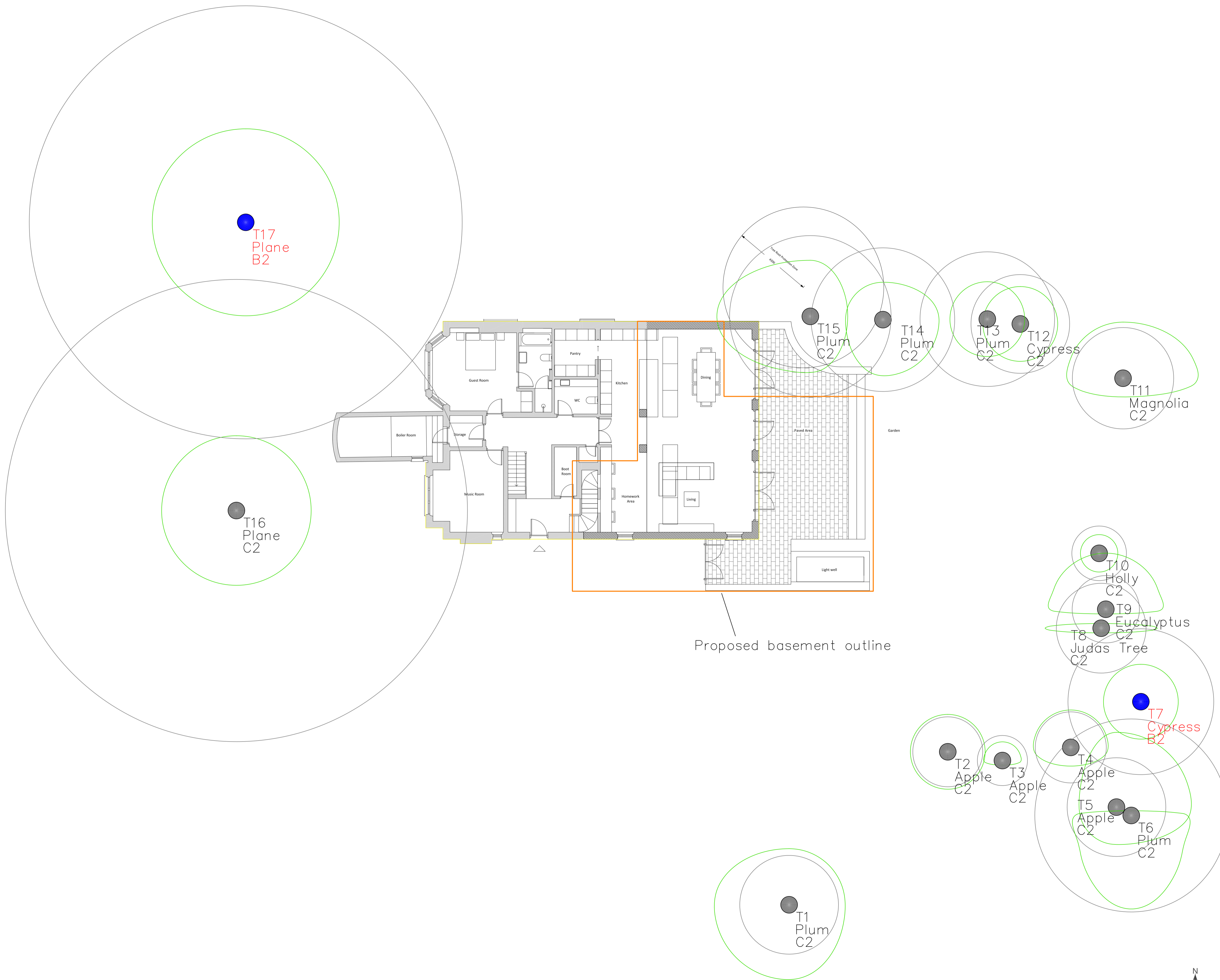
Tree Position Approximate (not shown on original survey)



## PLAN 2

### ARBORICULTURAL IMPACT ASSESSMENT PLAN (S)

- i. Lower Ground Floor with Line of Basement
- ii. Ground Floor



Proposed Lower Ground Floor Plan

**NOTE:**  
 This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.  
 Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.  
 Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

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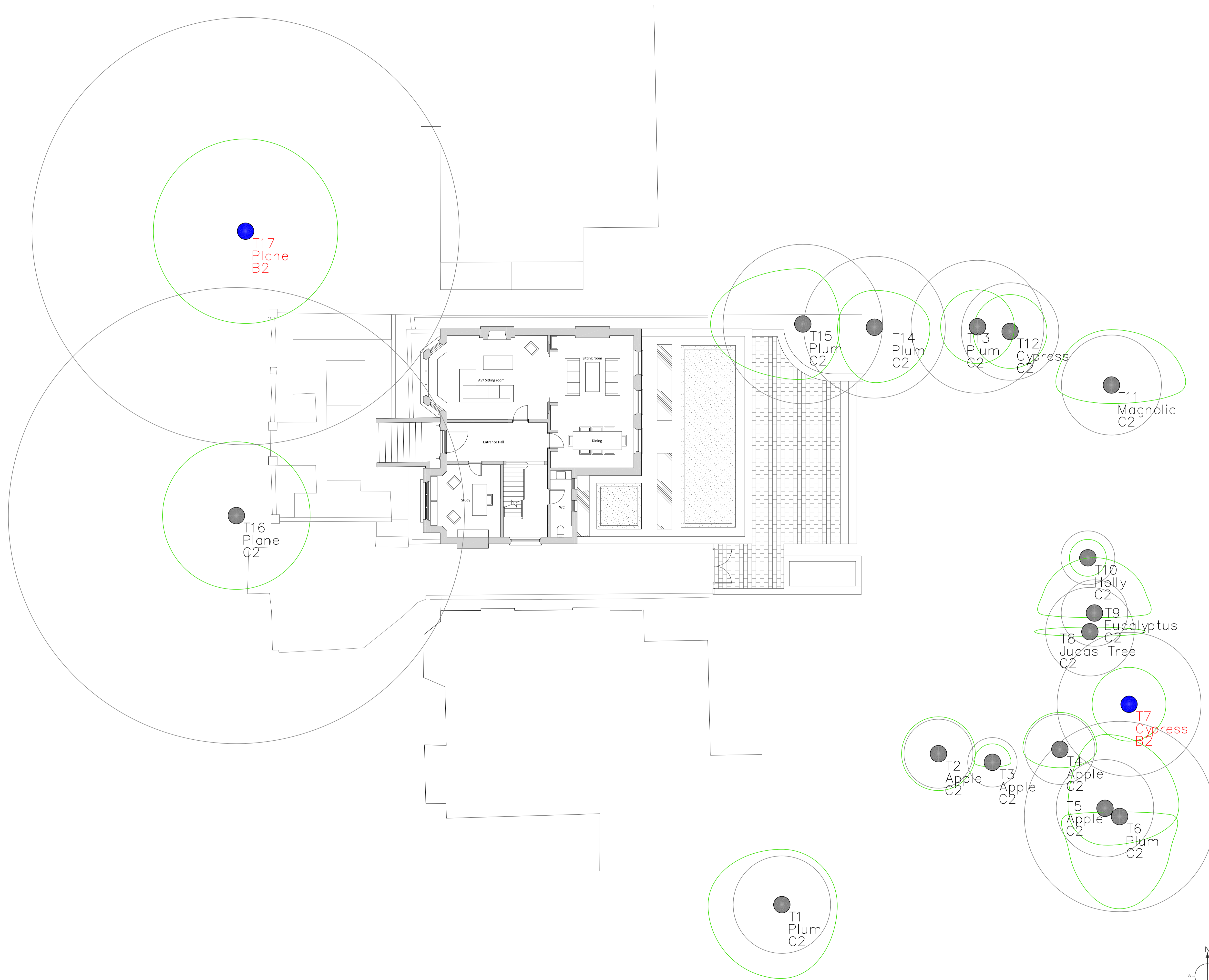
Site: 28 Maresfield 1:100@ A1  
 Drawing Title: Arboricultural Impacts Assessment August 2016

**Key:**

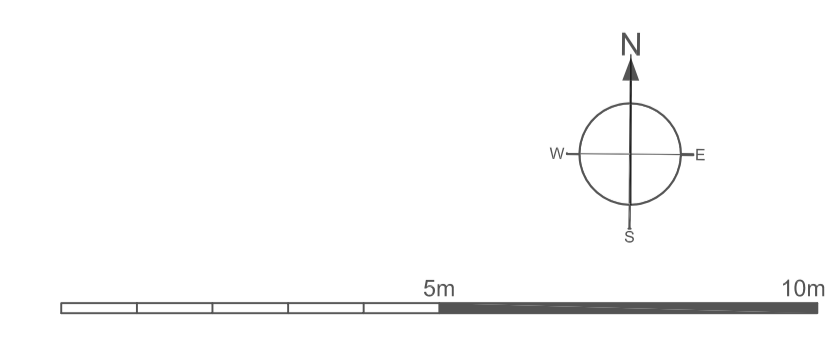
- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention

**Category**

- Crown Spread
- Tree Number
- Species
- Category
- Root Protection Area
- Tree Position Approximate (not shown on original survey)



Proposed Ground Floor Plan



**NOTE:**  
 This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.  
 Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.  
 Root Protection Areas (RPA) are derived from stem diameter measured at 1.5m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

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 e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 28 Maresfield 1:100@ A1  
 Drawing Title: Arboricultural Impacts Assessment August 2016

**Key:**

- Category A High Quality (Green circle)
- Category B Moderate Quality (Blue circle)
- Category C Low Quality (Grey circle)
- Category U Trees Unsuitable for Retention (Red circle)

Category (Green circle)  
 Crown Spread (Dashed line)  
 Tree Number (Number in circle)  
 Species (Text)  
 Category (Text)  
 Root Protection Area (Red line)  
 Tree Position Approximate (not shown on original survey) (Green hatched circle)