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Tree Survey

And

**Arboricultural Implications Assessment
& Arboricultural Method Statement**

For a development

At

**45 Langstone Road,
Havant,
PO9 1SB.**

By

Mick Jones RFS CERT ARB

***Client: Mr. Salter.
TC-TS-LRH
August 2017.***

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INFORMATION.

DAMAGE TO TREES.

A. General:

1. Trees that have good health and stability are well adapted to their surroundings. Any development activity which affects the adaptation of trees to a site could be detrimental to their health, further growth and safety. Tree species differ in their ability to tolerate change but all tend to become less tolerant after they have reached maturity or suffered previous damage or stress.
2. The part of a tree most susceptible to damage is the root system, which, because it is not immediately visible, is frequently ignored. Damage to, or death of the root system affects the health, growth, life expectancy and safety of the entire tree. The effects of such damage may only become evident several years later. Damage may be the result of a number of insignificant but compounding factors that can accumulate over time.

B. Extent and Form of the Root System.

1. **The root system is typically concentrated within the uppermost 600mm of the soil** although it may be deeper within the dense mass of roots and soil close to the base of the tree. Within a short distance of the stem the roots are highly branched, so as to form a network of small diameter woody roots, which typically extend radially for a distance much greater than the height of the tree, except when impeded by unfavorable conditions. All parts of this system bear a mass of fine, non-woody absorptive roots.
2. The root system does not generally show the symmetry seen in the branch system. The development of all roots is influenced by the availability of water, nutrients, oxygen, and soil penetrability. As far as these conditions allow, the root system tends to develop sufficient volume and area to provide physical stability.
3. **The uptake of water and nutrients by the root system takes place via the fine roots, typically less than 0.5mm in diameter. Their survival and functioning – which are essential for the health of the tree as a whole – depend on the maintenance of favorable soil conditions.** The fine roots are short – lived, with the majority dying each winter and with fresh ones developing in response to the needs of the tree.
4. **All parts of the root system, but especially the fine roots, are vulnerable to damage.** Once roots are damaged, water and nutrient uptake is restricted until new ones have grown. Depending on the time this may take, if at all, and the volume of roots able to grow back due to changed soil conditions, such damage may result in decline or ultimately the death of the tree. Mature and over-mature trees respond slowly, if at all, to damage to their woody roots.
5. Damage to the stem and branches of a tree is not usually sufficient to kill the tree directly but may make it unsafe by affecting the weight distribution of the crown or by facilitating decay in the long term. Such damage may also be disfiguring.

1 INTRODUCTION

1.1. **Brief:** I am instructed by Macaire Associates Architecture on behalf of Mr. Salter, to survey trees within and adjacent to a proposed development site at 45 Langstone Road, Havant, PO9 1SB, in anticipation of a planning application for the proposed development of a new detached dwelling. This will provide a report in accordance with the specification in BS 5837:2012 *Trees in relation to design, demolition and construction - Recommendations* indicating the possible constraints which may be associated with the trees.

1.2. **Purpose of this report:** The primary purpose of this report is for the architect and council to review the tree information pertaining to the site so as to inform and support both the development design and the planning application process. The report can be used as the basis for issuing a planning consent or engaging in further discussions towards that end. Within this planning process, it will be available for inspection by people other than tree experts so the information is presented in a way to be understood and helpful to those without a detailed knowledge of the subject.

1.3. **Qualifications and experience:** I have based this report on my site observations and the provided information, and I have come to conclusions in the light of my 30+ years arboricultural experience. I hold the Royal Forestry Society's certificate in Arboriculture and the LANTRA Professional Certificate for Tree Inspection.

1.4. **Documents and information provided:** I was provided with site plans: Site Survey. Site Location Plan. Proposed Site. These were supplied as a DWG and PDF electronic format by Macaire Associates. These plans have been utilized with permission to produce the plan for this survey. A tree survey is required to support the planning process.

1.5. **Scope of this report:** This report is only concerned with the trees which may have an effect on or be affected by the proposed development. This will also include any trees in surrounding areas or properties which may be relevant to a proposed development.

1.6. **Ecological constraints:** The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000, provides statutory protection to birds, bats and other species that inhabit or nest in trees. Although the presence or relevance of such wildlife may be noted within this report these issues are beyond my area of expertise, so advice from an ecologist must be sought to check if any relevant constraints may apply to this site.

1.7. **Limitations of use and copyright:** All rights in this report are reserved. No part of it may be reproduced or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, or stored in any retrieval system of any nature without our written permission. Its contents and format are for the exclusive use of the addressee in dealing with this site. It may not be sold, lent, hired out or divulged to any third party not directly involved in this site without the written consent of M Jones Arborist Consultancy IW. This report is valid for one year from the date of inspection.

2 SITE VISIT and OBSERVATIONS

2.1. **Site visit:** I carried out a site visit in June and July 2017 for tree recording purposes and to assess the site and trees.

All observations were from ground level and did not involve any climbing or detailed investigations beyond what was visible from accessible points at ground level. All dimensions were estimated unless otherwise indicated. The weather at the time of inspections was sunny, dry and calm.

2.2. **Brief site description:** The site is within a suburban area of Havant surrounded by detached residential properties. The site is part of the garden to the west of the existing house within the lawn area.

The site is screened by trees and hedges to the south, west and north and is level.

The surrounding landscape is residential property's with mature gardens and treed street scenes.

2.3. **Identification and location of the trees:** The trees in question are plotted as individuals on the site plans included as *appendices* with details recorded in the tree schedule. Dead trees, trees of below 75mm trunk diameter at 1.5m height or trees and large shrubs that have little or no landscape or amenity value either now or in the future have not been included within this survey.

2.4. **Restrictions:** An enquiry to Havant Borough Council in June 2017 indicated that the trees within and adjacent to the site area were not subject to an Tree Preservation Order (TPO) or within a conservation Area.

Explanatory Notes

- **Species:** I base the species identification on visual observations and list the common English name of what the tree appeared to be first, with the botanical name after in italics. In some instances, it may be difficult to quickly and accurately identify a particular tree without further detailed investigations. If I am unsure of the precise species of tree, I indicate the botanical name followed by the abbreviation sp indicating only the genus is known, in order to avoid delay in the production of the report. The species listed for groups and hedges represent the main component and there may be other minor species not listed.
- **Measurements/estimates:** All height and branch spread measurements are estimates unless otherwise indicated. A diameter tape is used to calculate the stem diameter. In cases where the tree is inaccessible when the diameter is estimated. This will be indicated by a * before the measurement. Any other measurements specific to a site or a particular tree will be indicated by ** and referred to as *additional observations*.
- **Height:** I estimate height to the nearest meter.
- **Stem diameter:** These figures relate to 1.5m above ground level and I record them in millimeters rounded up to the nearest five millimeters. Where a tree branches into two or more stems below 1.5m the measurement is taken immediately above the root flare. 'M' indicates trees or shrubs with multiple stems.
- **Branch spread:** I pace out to the measurement from the centre of the trunk to the tips of the live lateral branches to the four compass points.
- **Crown height:** This is the height of crown clearance from ground level to the lowest branches.
- **Age Class:** I estimate age from visual indicators and I assess the grades of maturity as follows. Young = less than one third life expectancy. Middle aged = one third to two thirds life expectancy. Mature = trees within their last third of normal life expectancy. Overmature = trees towards the end of their last third of normal life expectancy that are in an obvious state of decline. Veteran = notably old or ancient tree of a particular species that, by recognized criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving the typical age range for the species concerned.
- **Health:** This refers to the physiological condition of the tree and is categorized as follows. Poor = obviously in poor health. Fair = some visible evidence of decline or lack of vigor. Good = Appears to be healthy and vigorous.
- **Structural condition:** Poor = obviously in a dangerous, or potentially dangerous condition. Fair = some visible defects, but no significant hazards. Good = sound, healthy condition.
- **Remaining contribution:** Estimated remaining contribution in years (e.g. less than 10, 10-20, 20-40, more than 40).
- **Grading:** Category U = trees of very limited arboricultural value due to condition. Category A = trees of high quality and value. Category B = Trees of moderate quality and value. Category C = trees of low quality and value. *Trees are further graded into subcategories 1-3 in compliance with the cascade chart for quality assessment in BS 5837:2012.*

3 TREE SCHEDULE.

Tree Survey: The results of the survey are recorded in the table below. N.B. *This table should be read in conjunction with the explanatory notes.*

[illegible]

4. ARBORICULTURAL IMPLICATIONS ASSESSMENT (AIA)

A study was carried out to consider, identify, evaluate and possibly mitigate the extent of direct and indirect impact on or from the trees that may occur as a result of any proposed new development being constructed on the site.

4.1 Tree Constraints.

- **Tree Categorizing:** The trees have been categorized using the BS 5837:2012 Cascade chart for tree quality assessment and these are given in the Tree Schedule and are shown on the plan included in the *appendix* and represented as a colour.
 - Light Green = Category A trees: trees of high quality and value.
 - ◆ Mid Blue = Category B trees: trees of moderate quality and value.
 - Grey = Category C trees: trees of low quality and value.
 - U Red = Category U trees: trees unsuitable for retention.

Subcategory Criteria: 1. Mainly arboricultural values.

2. Mainly landscape values.

3. Mainly cultural values including conservation.

1. The trees on the site have been categorized as individuals and hedgerows, however it is recognized that if considered as a group the categorizing rating may be higher but still containing individual trees of a lower category.

- **Root protection areas:**

1. The root protection areas (RPA) for the surveyed trees have been calculated and determined using the formulae provided in BS 5837:2012 and shown graphically on the *Tree Constraints Plans*. In its simplest representation it indicates this as a circle with a radius from the trees' centre, however BS 5837 also recognizes that a RPA is influenced by other on site factors and states in 5.2.4 that it '*may change shape but not reduce its area whilst still providing adequate protection for the root system*'. This can be due to, '*b) The morphology and disposition of the roots, when known to be influenced by past or existing site conditions (e.g. the presence of roads, structures and underground services)*'.

- **Tree shadow/ shade:**

1. The proposed development has shade bearing trees to the south and the west that will give a shadow range that may be considered as a constraint towards the proposed dwelling.

- **Crown Spreads:**

1. The indicative crown spreads of the tree surveyed are shown on the *Tree Constraints Plans* included in the *appendix*. Any proposed development design must consider the proximity, dominance and possible nuisance to the building and its use from the crowns and branching system. The future crown spreads of the tree surveyed has also been considered in relation to the proposed development.

4.2 Tree Constraint Considerations: *General*;

On measuring and plotting the constraints of these trees, any development design and construction will need to consider any tree constraints. Any implications of this, from or to the trees must be considered and addressed. Possible solutions for this within BS 5873 may be:

A) Removal of the tree. This may be acceptable for category 'C' trees as BS 5837 states that "C category trees will not usually be retained where they would impose a significant constraint on development," however this may not be reasonable for higher category trees or 'C' grade trees or groups which may be retained for other reasons e.g. screening.

B) The re- positioning of the proposed development to outside the constraint.

C) To use construction methods which minimize the impact to the rooting system, this may be in the form of footings more radial to the tree roots, or sheathed micro-pile with footings- beams, slabs, suspended floors laid at or above ground level and cantilevered as necessary to avoid major tree roots. These conditions should also applied to kerb edges, driveways and hard landscaping, by using a three dimensional cellular confinement system, e.g. 'Celweb' to minimize compaction and maintain porosity to both water and gasses. Any impervious surface or covering (construction) to be installed over a RPA must cover no more than 20% of any tree total RPA area and in a tangential strip no wider than 3 meters. If this is exceeded then a system of irrigation to the covered area is to be provided, to compensate for the loss of 'open' root feeding area.

Any trenching for underground services will need to comply with National Joint Utilities Group (NJUG). *Guidelines for the planning, installation and maintenance of utility services in proximity to trees.*

Soil level changes, both lowering, or raising within a RPA should be kept to a minimum with any infill generally kept light and un-compacted.

D) To include within the development design elements which will minimize the affects of a current or future tree constraint, which may put future pressure on the tree to either be removed or pruned beyond what would be considered reasonable to maintain its amenity value and health, for example, to position windows or areas of high occupancy away from heavy shade or long periods of shadow.

NOTE i). With all the given current information and considering the longer term prospects of a tree in conjunction with the development the Planning Authorities may agree it suitable to remove a tree and replant with a species more suited or in a position more acceptable to the development.

4.3 Tree Considerations: *Items*;

The Town & Country Planning Act 1990 requires trees on or near development sites to be part of the material considerations within the planning process. The Local Planning Authority (LPA) is also **obliged**, to take steps, through the use of TPO's and Planning Conditions, and where it is considered appropriate, to retain and protect trees on development sites and to ensure the planting of new trees if considered necessary.

- **Tree Removals:**

1. The development will require the removal of the trees indicated as H1 and T2.
2. H1 is a declining Leyland cypress hedge alongside the western boundary and although it does offer some screening from the adjacent main road, there is a 2m high boundary wall behind it and the hedge itself is dying and infected with Corinium Canker which is further debilitating it.
3. This removal should be considered as normal garden maintenance and improvement works which could be carried out regardless of the proposed development.
4. T2 is a small suppressed Monterey Cypress with a low crown over the proposed new driveway entrance and will require heavy pruning if retained.
5. The loss of this low grade tree will have no impact to the wider landscape amenity of the area.
6. Tree removals will not be considered as a material constraint towards the development.

- **Root Protection Areas:**

1. The root protection area (RPA) for the surveyed trees has been calculated and determined using the formulae provided in BS 5837; 2012.
2. The main development buildings have been positioned to the outside of the PRA of any of the retained trees.
3. The new driveway is shown to cross sections of the RPA of T1, T3, T4 and T5.
4. It is to be presumed that roots from these trees are also within the grass verge and under the pavement of Langstone Avenue, (which is showing signs of cracking due to root growth).
5. As such the driveway entrance over the verge and the driveway area within the garden must be constructed in a manner that will cause the minimal impact towards the rooting system of the trees, both during the construction of the driveway and for the continued wellbeing of the trees.
6. The new drive and entrance will be constructed using a three dimensional cellular confinement system, e.g. 'Celweb' to minimize compaction and with a porous surface and sub-base to maintain porosity to both water and gasses and constructed on the existing ground levels.
7. If suitable, the existing tarmac pavement is to be left in place and can be driven over.
8. Other properties within the same road have driveway entrances that do the same and appear to be fit for the purpose and has not been detrimental towards any adjacent trees.
9. To form the dropped kerb and access across the grass verge some soil excavation will be required, which is likely to uncover some tree roots.
10. This excavation and construction of the cross-over access will be kept to a minimum by again using a three dimensional cellular confinement system with a porous surface. (A bonded resin gravel surface, such as the product 'Flexistone' would be a suitable system to be used in this situation subject to LPA approval.)

11. This encroachment is minor when considered with the overall RPA of these trees, and any minor root loss on the edge of their RPA along with a root sensitive construction will not be detrimental towards the stability or the future health of the trees.
12. The proposed garage footprint is within sections of the shown RPA of TB, TC, TD, TE and TF. (Note: Due to the western boundary wall foundations, which will have acted as a partial root barrier, it is likely that a great majority of the roots of these trees are within the wide grass verge to the west. It is probable that any roots from these trees that have colonized under the foundations and into the garden are at a greater depth, at the garage position, than normally expected due foundation depth and the once dominant Leyland Cypress hedge roots.)
13. In discussions with the architect, it is proposed to construct the garage on a re-enforced concrete slab and anchored in place with mini or screw piles to minimize any impact towards the trees.
14. This method of construction will have minimal impact towards the trees, which as a species, Holm Oak, are very tolerant of ground change and pruning, both above and below ground.
15. The rainwater run off from the garage roof will be allowed to drip off and continue to percolate into the surrounding soils and continue to feed the adjacent trees.
16. The PRA of the adjacent trees will not be considered as a material constraint towards this development.

- **Tree shadow/ shade:**

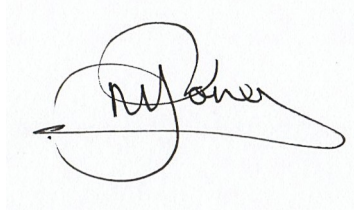
1. Although the site has trees to the south and west, the shade range cast from these trees varies during the day, giving both direct and light and dappled light to the site as the sun moves further to the west.
2. The development has been positioned within an area of least shade (even this is less than indicated, as the shade from the closest tree, TG, to the west, is from a Scots Pine with a high crown, so direct sunlight will still shine onto the dwelling, coming under the tree canopy.)
3. Both direct light and ambient light levels will vary during the year as the deciduous shade bearing trees, in particular TA, the Lime tree to the south, will be losing their leaves in the winter months, therefore reducing any shade density.
4. Some shading from these trees will also be of benefit towards the occupants within the dwelling and driveway area during the hotter periods of the year.
5. The majority of the tree shading is within the amenity garden area to the south of the dwelling, which is the same as what already exists for the current house occupants, which is acceptable and this shading has not placed pressure to have trees removed.
6. Shade and shadow from the adjacent trees should not be considered as a material constraint towards this development.

- **Crown Spreads:**

1. The current crown spread of the retained trees will not encroach towards the development dwelling and garage, The boundary trees / hedges can continue to be pruned back and re-form into more suitably maintainable screening 'hedgerow' for the future once the hedge H1 is removed as normal garden maintenance works regardless of the proposed development.
2. The crown spread of the trees will not be a constraint towards the development.

5. CONCLUSIONS:

1. After considering the constraints of these trees and the area available for the development design, I consider it is feasible to construct the development within this area whilst adequately providing for the wellbeing of the retained trees
2. If adequate precautions to protect and manage the tree are further detailed and specified within an Arboricultural Method Statement and implemented in conjunction with the construction of the development, the development will have no adverse impact to the local tree landscape amenity in the future.

A handwritten signature in black ink, appearing to read 'Mick Jones', is written over a large, faint circular stamp or watermark.

Mick Jones. Cert Arb. RFS.

Appendices

TREE CONSTRAINTS PLANS 1:100@A1

**Tree Categories,
Root Protection Areas,
Crown Spreads,
Shade and Shadow.**

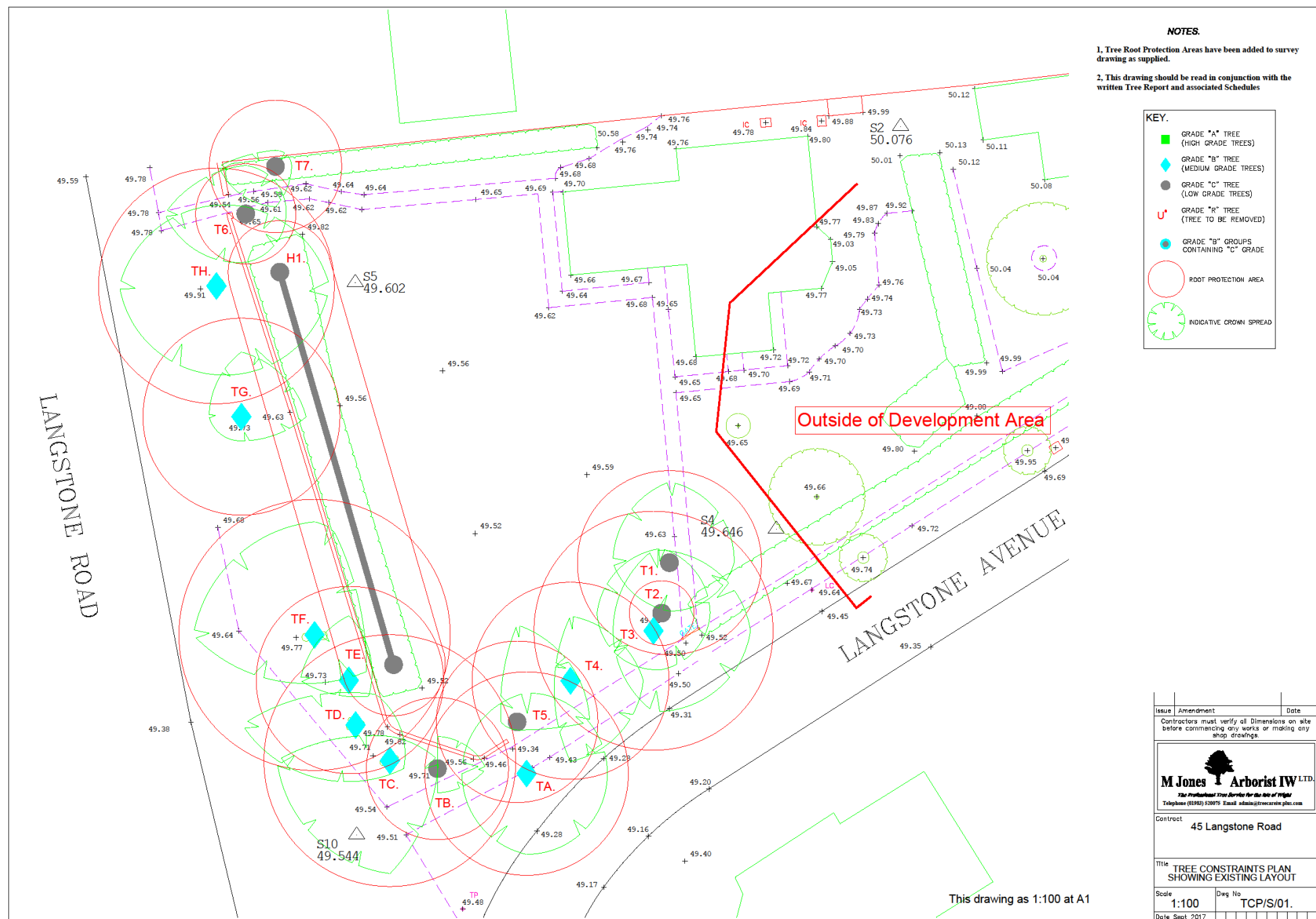
EXISTING SITE PLAN

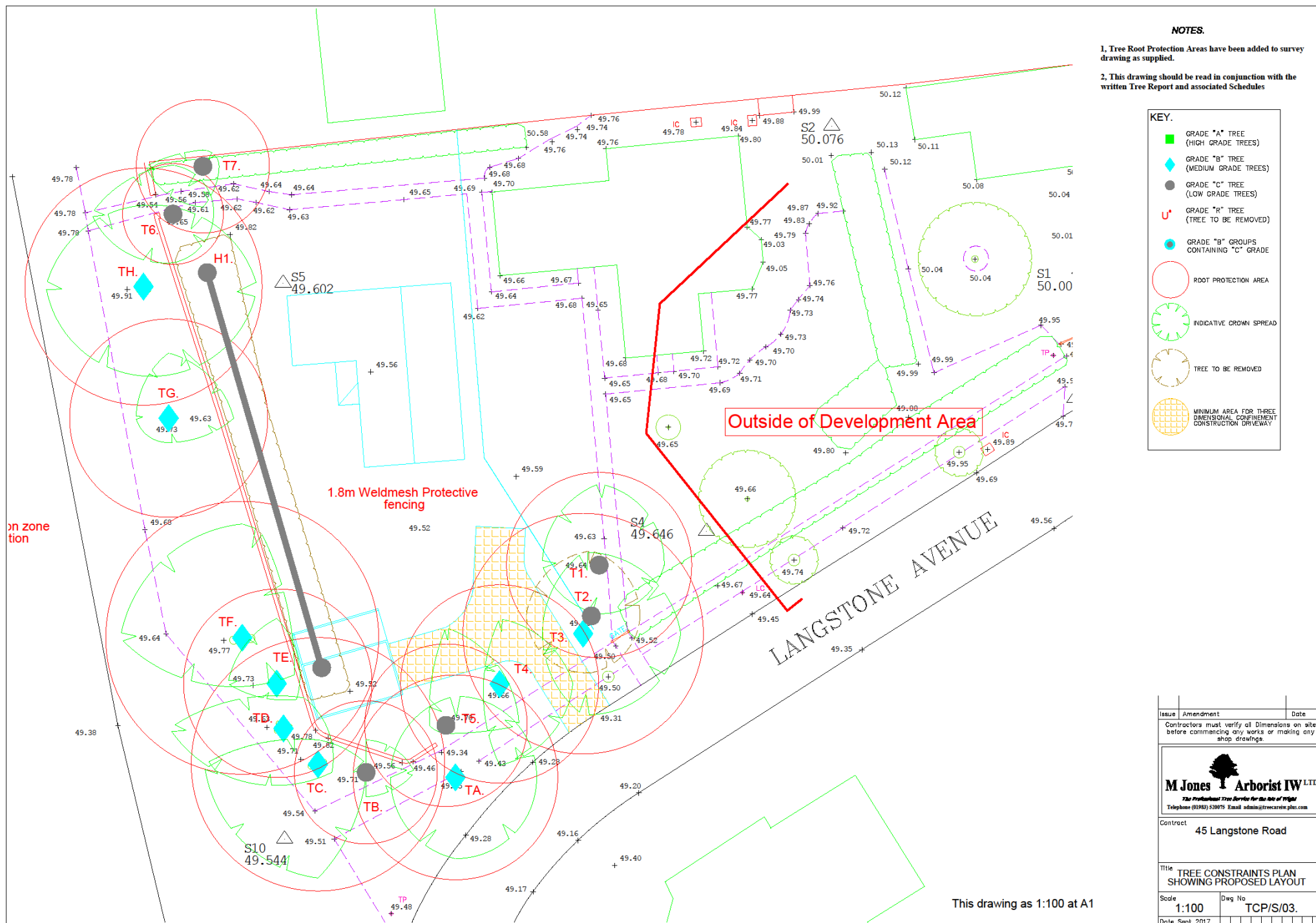
PROPOSED SITE PLAN

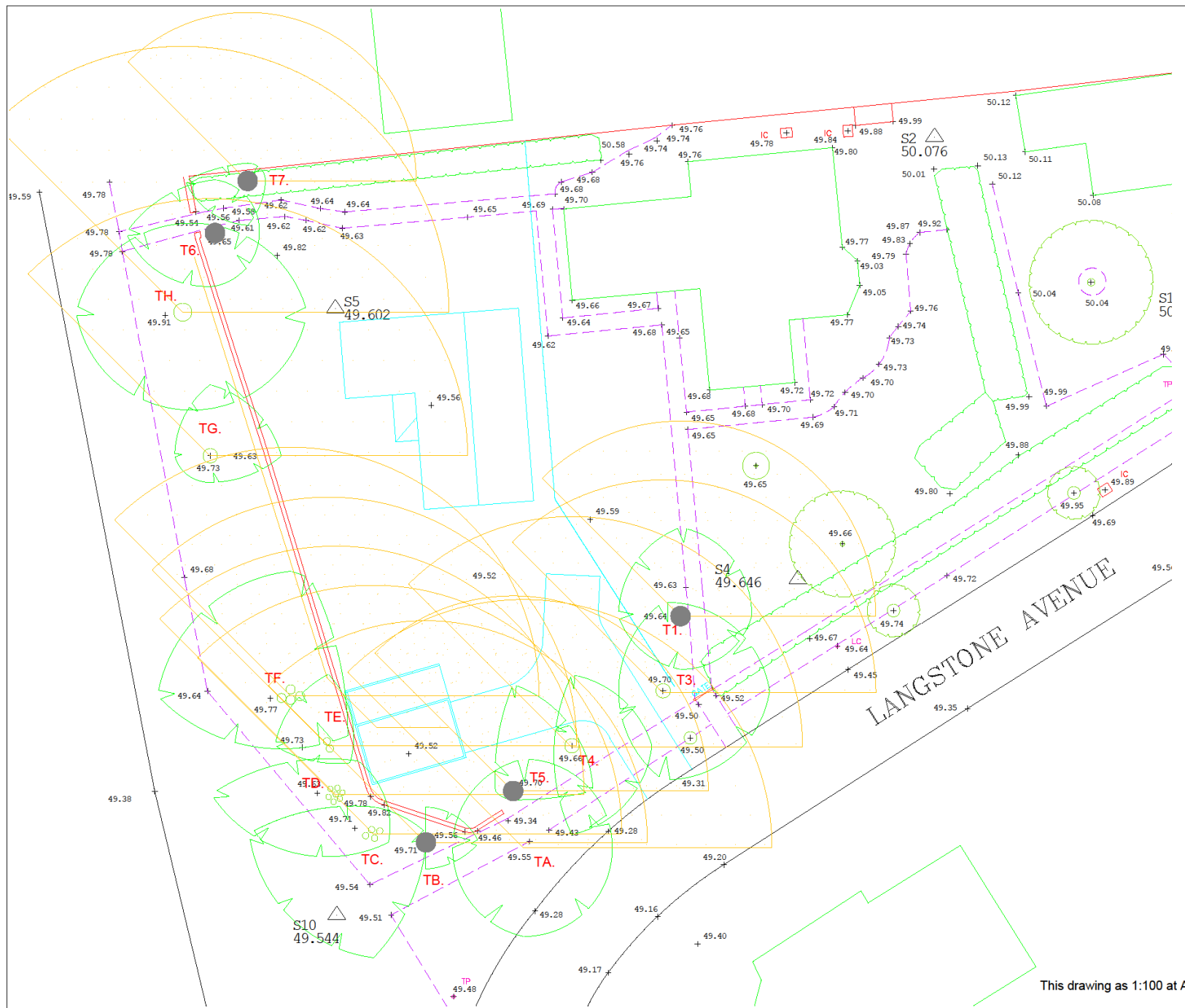
PROPOSED SHADE PLAN

TREE PROTECTION PLAN

ARBORICULTURAL METHOD STATEMENT.







NOTES.

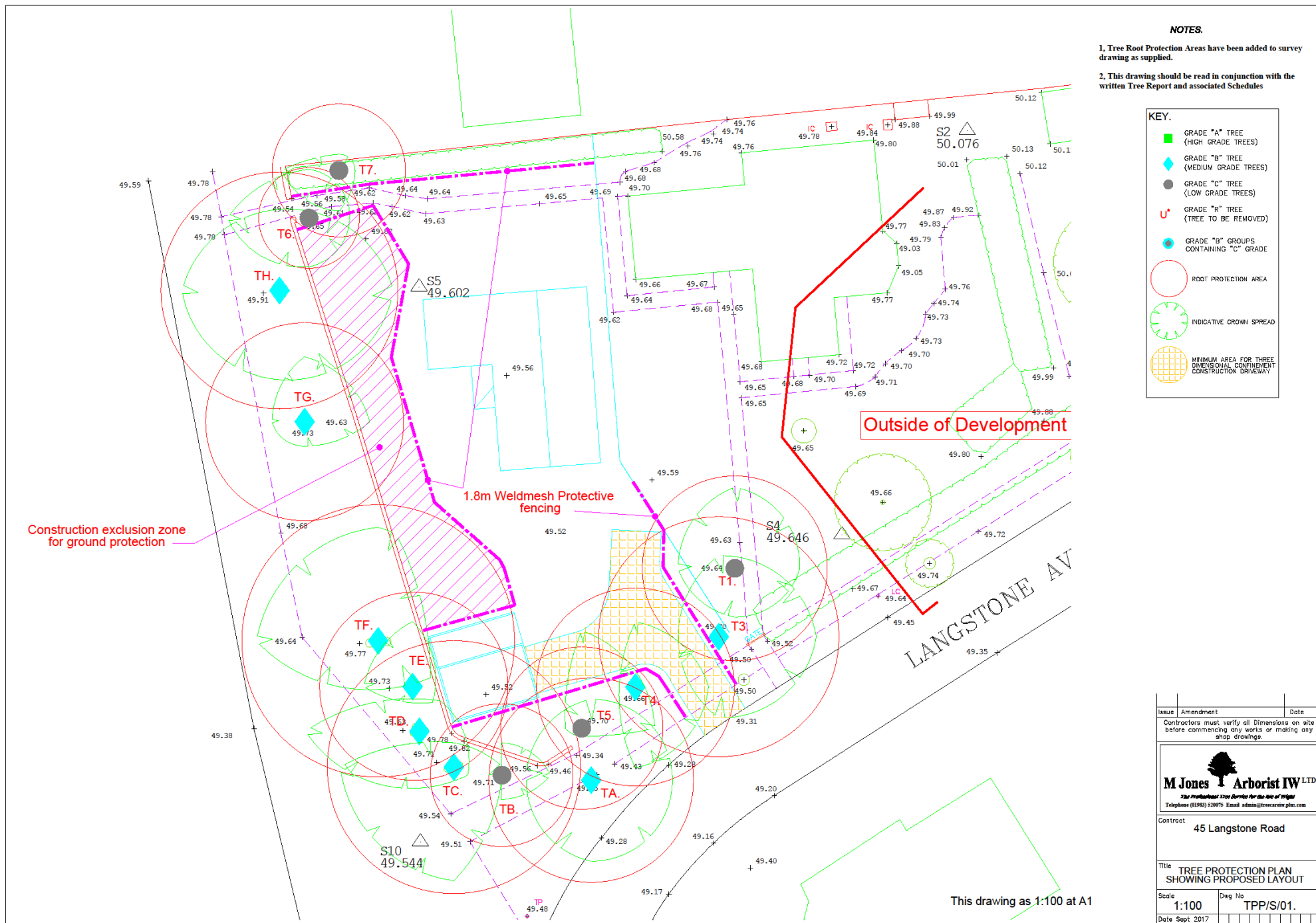
1. Tree Root Protection Areas have been added to survey drawing as supplied.
2. This drawing should be read in conjunction with the written Tree Report and associated Schedules

KEY.

- GRADE "A" TREE (HIGH GRADE TREES)
- GRADE "B" TREE (MEDIUM GRADE TREES)
- GRADE "C" TREE (LOW GRADE TREES)
- GRADE "R" TREE (TREE TO BE REMOVED)
- GRADE "B" GROUPS CONTAINING "C" GRADE
- ROOT PROTECTION AREA
- INDICATIVE CROWN SPREAD
- INDICATIVE SHADE RANGE

Issue	Amendment	Date
Contractors must verify all Dimensions on site before commencing any works or making any shop drawings.		
 M Jones Arborist IW LTD. The Professional Tree Service for the Isle of Wight Telephone (01883) 520075 Email mjohnes@treecareiw.plus.com		
Contract 45 Langstone Road		
Title TREE CONSTRAINTS PLAN SHOWING PROPOSED LAYOUT		
Scale 1:100	Dwg No TCP/S/04.	
Date Sept 2017		

This drawing as 1:100 at A1



NOTES.

1. Tree Root Protection Areas have been added to survey drawing as supplied.
2. This drawing should be read in conjunction with the written Tree Report and associated Schedules

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- GRADE "A" TREE (HIGH GRADE TREES)
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- GRADE "R" TREE (TREE TO BE REMOVED)
- GRADE "B" GROUPS CONTAINING "C" GRADE
- ROOT PROTECTION AREA
- INDICATIVE CROWN SPREAD
- MINIMUM AREA FOR THREE DIMENSIONAL COMPONENT CONSTRUCTION DRIVEWAY

Issue	Amendment	Date
Contractors must verify all Dimensions on site before commencing any works or making any shop drawings.		
M Jones  Arborist IW LTD. The Professional Tree Service for the City of Wigan Telephone (01983) 520076 Email admin@treecareplus.com		
Contract 45 Langstone Road		
Title TREE PROTECTION PLAN SHOWING PROPOSED LAYOUT		
Scale 1:100	Draw No TPP/S/01.	Date Sept 2017

ARBORICULTURAL METHOD STATEMENT.

BS 5837:2012-Arboricultural method statement (AMS):

a method for any aspect of the development that has the potential to result
in loss or damage to a retained tree

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CONSIDERATIONS OF THIS METHOD STATEMENT

A. ARBORICULTURAL METHOD STATEMENT

B. DEVELOPMENT / PROTECTION TIMING

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H. MONITORING CALENDAR FOR PROTECTION WORKS

CONSIDERATIONS OF THIS METHOD STATEMENT

BS 5837:2012 *Trees in relation to design, demolition and construction-*

Recommendations indicating the possible constraints seek to provide a best practice guidance of the principles and means to protect trees which can be applied to achieve a satisfactory juxtaposition of trees with structures.

As such the recommendations cannot be considered as 'site specific' for all developments but must be considered as flexible guidelines which must be able to be adapted to a specific site or situation depending on the nature of the site, its trees, and the construction process required by other standards. It may also require adaptation due to the availability of further information (such as root investigation pits) often as an ongoing process as situations and environments change throughout a construction period.

- This on going assessment process will not only be to aid the development but also to be able to consider adjusted construction methods to maintain a realistic best practice method for tree protection.
- This development will adopt a 'hands on' approach to the tree protection with every site worker made aware of the tree protection requirements with this on going method statement being available for view to all site workers as part of their site induction.

A. ARBORICULTURAL METHOD STATEMENT.

Arboricultural method statement (AMS): a method for any aspect of the development that has the potential to result in loss or damage to a retained tree. This will include the details of on site protection and the style and installation of tree protection barrier fencing.

A.1. Awareness:

- All personnel engaged on site with the development and its construction works shall be briefed at the outset of any works, so that they are clear as to the nature and extent of the tree protection measures required on the site.
- Personnel are to be made aware that the protection measures are required as a condition of a planning approval, assuming that such conditions have been made, and that the failure to comply with the approved Arboricultural Method Statement and stated protection could lead to the issuing of a site stop notice and possibly the revoking of a planning permission.
- Personnel are to be made aware with which the ease a tree can be damaged during a development, even if this damage or the effects from it are not apparent at the time of the development works.

A.2. General:

- Care must be taken not to damage retained trees with wide or tall loads, construction machinery and plant.
- Vehicles and plant shall not run on or park on a retained trees un-protected Root Protection Area (RPA) or Construction Exclusion Zone.
- Construction materials will not be stored within the RPA or Construction Exclusion Zones.
- Waste and demolition material will not be stored within or anywhere where contaminants from this can be spread or washed into a RPA or Construction Exclusion Zone.
- Soil contaminants e.g. concrete mixings, cements, fuels, and any washing's will not be emptied within 10meters of a tree stem (or outside a tree RPA if that is shown to be greater) or outside that distance where contaminants from this can be spread or washed into a RPA or Construction Exclusion Zone.
- The positioning of site toilets and wash facilities shall be outside the trees RPA and any waste or run off from these shall not be allowed to flow into a RPA or Construction Exclusion Zone.
- Fencing, signs, site level pegs or overhead services shall not be attached to the trees.
- Fires shall not be lit where they can damage any parts of the tree or spread within the ground to an RPA.

B. Development / protection timing.

1. Carry out the tree and hedge removals as agreed to facilitate the erecting of the tree protective fencing and any ground protection.
2. Install the protective fencing and any ground protection, including a bunded mixing area as required.
3. Following the tree removals and the installation of the tree protection fencing / ground protection, the next phase will be to construct the new driveway access and garage.
4. The construction of the sub base of the driveway and parking areas will form the ground protection for the duration of the development construction. The final porous top surface will be laid as a final phase of any hard landscaping of the development.
5. The garage base and shell will be constructed before the main dwelling as this will act as a site storage area for the development.

C. Tree Works.

Prior to any development works tree surgery works will be required to allow access to the site and for the installation of any tree protection fencing barriers. These works will be carried out to BS 3998:2010. *Recommendations for tree work.*

C.1. Tree Schedule:

1. Remove T2 and H1.
2. All timber and arisings will be removed from site.

C2. Post- tree Works:

After construction completion the retained trees shall be inspected by a competent Arborist. Any accidental damage found from the works will be noted and a schedule of remedial works drawn for the approval by the LA and undertaken before the site is 'signed' off as finished.

D. Tree Protection.

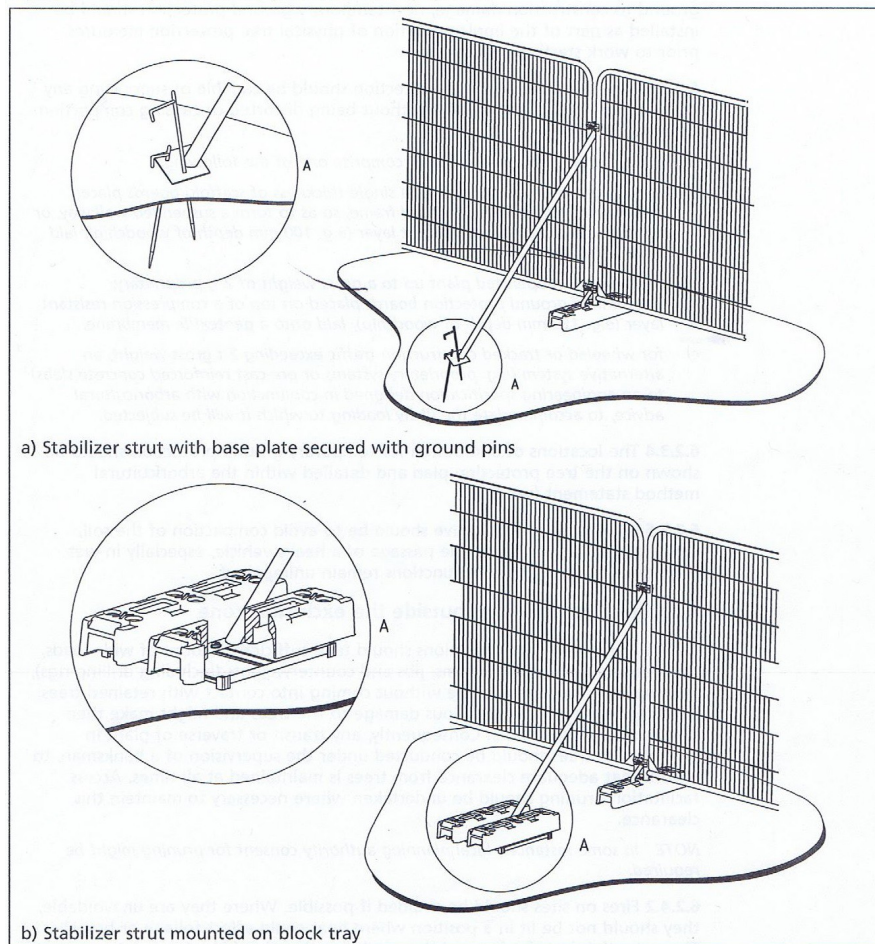
Prior to any construction works tree protection barriers are to be installed around retained trees or to exclude access to areas which may require protection from compaction or contamination from construction works, (construction exclusion zones, C.E.Z.). These barriers are to be maintained in good order during the construction stages. The recommendations within *BS 5837 2012* are for the fencing to consist of:

1. 1.8m high 'Herras' weld mesh panels attached with stabilizing bracing as required. *Figure 3.*
2. The positioning of the fencing is indicated in the Tree Protection Plan (TPP) included in the *appendix.*
3. Any protection removed or damaged during works will be replaced in good order on completion of the particular works or immediately after damage is noted.

Cont:

4. Where construction working space is required within the RPA this will be facilitated by the setting back of the tree protection barrier and installing ground protection fit for the purpose of the intended weight of the machinery or the pedestrian traffic used for the works, such as proprietary ground protection such as 'Arbortrack' or 'Ground Guards'.
5. For pedestrian pathways to these within an RPA (outside of the existing driveway) a single thickness of scaffold boards on top of a compression resistant layer (e.g. 100mm depth of woodchip), laid onto a geotextile membrane will be used.
6. An area will be set up as the 'site compound' area for storage of aggregates, heavier construction materials and cement and concrete mixing and fuels.
7. This area will covered with a non permeable membrane (tarpaulin or polythene sheeting) and will be bunded to prevent any contaminants and accidental spillages from leaching into the top soil, over this will be plywood sheeting or similar, to form a suitable and practical work surface.
8. Any Protection Barriers will remain in place until the construction works are complete and all construction equipment, materials, waste and spoil have been removed from site.

Figure 3 Examples of above-ground stabilizing systems



E. Groundworks / Foundations:

1. All of the access for the excavation works for the new driveway and entrance and the garage foundations will be either from the existing road hard surface or the new driveway as it is rolled out.
2. If deemed suitable, the existing tarmacadam pavement is to be left in place and can be driven over, with additional ground guard protection for any larger construction machinery or vehicles.
3. Driveway and parking area:
Three dimensional cellular confinement system: General specification.
 - The ground levels will be retained with only the top turf or existing landscape layer (50mm) being prepared for the system.
 - A porous geotextile membrane will be laid over the area and pinned in place.
 - The `grid` will be laid out over this membrane. The depth of the grid will be fit for the purpose of its` intended use. (manufactures guidance).
 - Clean, salt free and low in fines angular stone – 40/20mm will be used to fill the grid cells.
 - The edges will be of a retaining board and peg / or an integral edging system or using local top soil haunching, not a concrete kerb edging with foundations.
 - The construction will remain porous throughout.
4. The concrete slab foundation for the garage will be constructed as close to or on the existing ground levels as feasible.
5. If required these will be anchored to the ground using a mini or screw pile system of a minimal size for the construction and located to avoid any major roots that may be found during their installation.
6. A mindful and best practice approach will be adopted to any presumed living roots that may be uncovered during and excavation/ foundation works.
7. Roots smaller than 25mm diameter that may be uncovered during these works may be pruned back, preferably to a side branch using sharp tools such as bypass loppers or hand saws.
8. If significant larger roots (above 25mm diameter) or large amount of smaller roots are found then a best practice of root retention and protection will be adopted at the recommendations of the arborist.
9. Where possible, roots to the edge of the excavations will be left in place and carefully re-directed back into the surrounding soil.
10. Roots larger than 25mm shall only be cut following consultation with the on site arborist as these may be essential to the trees health or stability, otherwise they are to be retained.
11. Any roots exposed shall be protected from any bark damage and prevented from drying (desiccation) and from rapid temperature change by wrapping them in clean, dry hessian sacking. The protected roots will then be re-covered as soon as possible by un-compacted, clean, local top soil.
12. Any foundation or pile that may require surface concrete to set it in place shall have the soil surfaces sheathed with a non porous membrane to prevent any concrete contamination to the soil and any adjacent roots.

Cont:

13. This protection will be an ongoing process, revised and amended as the works progress to best accommodate any living rooting system that may be uncovered.

F. Underground Services:

1. Where possible existing underground services are to be utilized.
2. If trenching is necessary for the services, through a RPA then it shall be hand dug and kept as narrow as possible and installed in accordance with NATIONAL JOINT UTILITIES GROUP (NJUG), *Guidelines for the planning, installation and maintenance of utility services in proximity to trees*.

G. Monitoring:

1. All site workers will be briefed/ inducted as to the importance of the tree protection within the site and will have access to this Arboricultural Method Statement which will be available to anyone on site. An arborist will be available to monitor advise and liaise with the site developer to maintain the tree protection and a best practice approach during the construction within tree sensitive areas.

H. Monitoring calendar for protection works:

1. Regular inspections will be made by the qualified site Arborist, familiar with the site, development and its` requirements.
2. These visits will be logged and noted on the following tree protection calendar at the various stages of construction and subsequent protection actions taken.
3. These stages and associated protection will be signed off by the arborist as the work progresses.

TREE PROTECTION CALENDAR

Stage of protection	Comments / Recommendations	Protection carried out/ Acceptable	Signed / Date
Protective Fencing installation.			
Temporary Ground Protection.			
Site Setup / Storage			

Stage of protection	Comments / Recommendations	Protection carried out/ Acceptable	Signed / Date
Piling Within Root Protection Areas			
Underground Services Excavations			
Paving/ Kerbs / Edging			

Stage of protection	Comments / Recommendations	Protection carried out/ Acceptable	Signed / Date
Additional Protection			
Additional Protection			
Landscaping / Site Completion			