Arboricultural Implications Assessment and Method Statement
Relating to
Proposed Development

At
33 Princes Rd
Chinley



Report By:

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4.0 ARBORICULTURAL IMPLICATIONS ASSESSMENT

4.1 The purpose of this report is to:-

a) Assess the implications, if any, which the proposed development will have on the trees identified in the survey of 4th June 2013 carried out by A.M. Beech.
b) Advice on arboricultural measures, which would be likely to mitigate any damage resulting from the proposed development.

4.2 All background information from which this report is based has been taken from the initial survey, as stated in point 4.1 (a), by A.M.Beech.

4.3 The limitations of this report are restricted to the persons, time, information made available and purpose for which this report has been prepared.

5.0 ASSESSMENT

5.1 The Site Layout Plan within APPENDIX FIVE identifies the trees in relation to the proposed development.

5.2 In order to fully assess the impact of the proposals, an Implications Table has been created, which gives details of the proximity of the associated works to the trees, other than the trees which are to be removed to allow for the development.

5.3 The below Implications Table details the Root Protection Area (RPA) in accordance with the British Standard 5837 :2005 *Trees in Relation to Construction – Recommendations.* This is an area that should be left undisturbed in order to provide adequate rooting area for retained trees. This is also illustrated on the Site Plan of APPENDIX FIVE.

5.4 The information can then be used in accordance with BS 5837 :2005 to determine whether the development will have a detrimental impact on the health of the trees. Once this has been determined, remedial measures can be detailed to reduce the impact the proposals will have.

5.5 Implications Table:-

Tree No	Multi-Stemmed Yes/No	Root Protection Area (m^2)	Circle Radius (m)	30% Offset Circle Radius (m)	Distance to any proposed construction or surfacing from stem (m)	Can the Tree be Successfully Retained
T1	No	23.9	2.76		6	Yes
T2	No	55.4	4.2		11.5	Yes
T3	No	30.5	3.12		6	Yes
T4	No	145.2	6.8	4.76	5	Yes
T5	No	162.8	7.2	5.04	8	Yes
T6	No	16.33	2.28		9	Yes
T7	No	289.5	9.6		17	Yes
T8	No	63.6	4.5		19	Yes
T9	No	116.9	6.1		20	Yes
T10	No	5.3	1.3		15.5	Yes
T11	No	4.5	1.2		14	Yes
T12	No	116.9	6.1		19	Yes
T13	No	191.1	7.8*		25	Yes
T14	No	28.2	3.0		19.5	Yes
T15	No	191.1	7.8*		17	Yes
T16	No	8.04	1.6		10	Yes
T17	No	5.3	1.3		4.5	Yes
T18	No	4.5	1.2		4.5	Yes

* = No access to base figures based on estimated radius

6.0 IMPACT ASSESSMENT

6.1 To assess the implications of the proposed development, each tree, or group of trees, can be categorised in the following way:-

	Tree to be Retained – No Impact	Tree to be Retained – With detailed methodology	Trees to be removed due to condition	Trees to be removed due to Development
Tree No	T1,2,3,6,7,8,9,10,11 12,13,14,15,16,17 & 18	T4 & T5	None	See 7.1.1

7.0 MITIGATING PROPOSALS

7.1 Tree Loss and Replacement Planting

7.1.1 It has been agreed with Monica Gillespie (11/06//13) that a large number of trees on the site which are non native and/or poor examples can be felled to allow for the development.

7.1.2 It is proposed that a “wildlife corridor” will be maintained along the line of the brook running approximately north to south along the eastern border of the site.

7.1.3 It is proposed that the site will be landscaped after development, replacement trees should take into account the confines of the site when such trees reach maturity.

7.2 Development

7.2.1 As shown above, the Implications Table identifies the potential for the proposed development to have an impact on the long term retention of T4 and T5, foundations are within the Root Protection Area of T4

7.2.2 However, with careful excavation and careful root pruning the retention of these trees is still considered viable.

7.3 Tree Protection

7.3.1 A clear tree works specification and details of all the protective measures can be found in the following Arboricultural Method Statement (Section 9.0)

8.0 DISCUSSION

8.1 The majority of the root system, of a tree, is in the surface 600mm of the soil extending radially for distances frequently in excess of the trees height. Beyond the main structural roots (close to the base of the trunk), the root system rapidly sub-divides into smaller diameter roots: off this main system, a mass of fine roots develops.

8.2 The shape of the main structural roots develops in response to the need for the tree to have physical stability. Beyond these major roots, root growth and development is influenced by the availability of water and nutrients. Unless conditions are uniform around the tress, which would be unusual, the extent of the root system will be very irregular and difficult to predict. It will not generally show the symmetry seen in the branch system. In this case, however, it is suggested that rooting within the development site may be limited due to the following factors:

a) The gradient of the site would favour water & nutrients being more freely available at the lower end of the gradient.

8.3 The parts of the roots system, which are active in water and nutrient uptake, are very fine, typically less than 0.5mm diameter. They are short lived, developing in response to the needs of the tree, with the majority dying each winter. It is *essential* that conditions in the soil remain conducive to the healthy growth of these fine roots to that the water and nutrients necessary for healthy tree growth can be absorbed.

8.4 All parts of the root system, but especially the fine roots, are vulnerable to damage. Once they are damaged, water and nutrient uptake will be restricted until new roots have regenerated. Vigorous, young trees will be capable of rapid regeneration, but over-mature trees will respond slowly, if at all.

8.5 In order to live and grow, roots need oxygen from the soil. Respiration by the roots and other soil organisms depletes this oxygen and increases carbon dioxide levels in the soil; a correct balance of these gasses is normally maintained by diffusion between the soil and the atmosphere. Anything, which disturbs this balance, will affect the condition of the root system.

8.6 The factors that most commonly affect this diffusion adversely, and therefore damage roots, are the following;-

a) Compaction of the ground, which reduces the space between soil particles. This is particularly important on clay soils. A single passage by heavy equipment on clay soils or storage of heavy materials can cause significant damage.
b) Changing soil levels, even for a few weeks.
c) Covering the root area with impervious surfaces.

d) A rise in the level of the water table. Roots can tolerate submersion for short periods, but a permanent rise will deplete the soil of oxygen.

8.7 Serious damage is often caused during preliminary site works by stripping the topsoil. For this reason, such works should be avoided until protective fencing has been erected.

8.8 Excavations in the rooting area can sever roots. As the majority are in the surface 600mm, even shallow excavations can cause damage.

8.9 Excavations for foundations, landscaping or service trenches are usually sufficiently deep to sever most of the roots, and it should therefore be assumed that all parts of the roots system beyond the excavation would no longer serve the tree.

8.10 Excavation or soil stripping, which sever or damage the roots may impair the stability or the tree and make it dangerous.

9.0 METHOD STATEMENT

Before any form of development commences on the site, the following works should be undertaken:-

9.1 Tree Works

Tree No	Proposed Works
Trees identified at the pre application meeting	Fell
T4	Remove dead wood & reduce branches growing towards the development at a suitable growing point & by no more than 3m
T5	Reduce the crown on the western side by 1.5m – 2m & at a suitable growing point

Recommended works should be carried out to the British Standard Recommendations for Tree Work BS3998: 2010

As the property will measure 7.275m to the gutter and 10m to the ridge the above recommendations for reduction will help to prevent damage to the crown during construction

9.2 Excavation in Root Protection Area's

Part of the building construction is within the Root Protective Area (RPA) of T4 & T5. This is illustrated on the plan of APPENDIX FIVE. In this area the following specification will be applied. **Any excavations, which have to be undertaken within the root protection area, should be carried out carefully by hand and any roots encountered in those areas should be severed cleanly with a sharp tool, avoiding ripping or snagging. Prior to backfilling, any retained roots should be surrounded with sharp sand (builders sand should not be used because of its high salt content, which makes it toxic to roots), or other loose granular fill, before soil or other material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.**

9.2.1 In the case of T2 it is understood that there will be changes to the ground level as it is proposed that this will slope upwards from its current level to meet the service road. If imported, additional soil used to create this slope should be of a type that is approved for horticultural use.

9.2.2 Any compaction caused by the construction of the slope within the RPA of T1 – 3 may be alleviated by measures such as including organic material (not peat) within the added top soil and careful forking and spiking to a depth not greater than 300mm below the current ground level.

9.3 Protective Fencing

9.3.1 All fencing used on the site should fully comply with BS 5837:2012 *Trees in Relation to Construction – Recommendations.*

9.3.2 The fencing should be strong and suitable for local conditions. It should also take into account the degree of construction activity on the site.

9.3.3 In this circumstance, the location for the protective fencing should be as shown on the Tree Protection Plan of APPENDIX FIVE and of the following specification.

9.3.4 Heras-type fencing is to be used along the Eastern boundary of the site (with the bases securely pinned to the ground) to prevent direct physical contact with the stems of the trees on the adjacent property.

9.3.5 No storage of materials or any construction operations should occur within the fenced area. Additionally, when designing the site layout, account should be taken of the route/installation method of underground services/drains and, the route/construction method of new access road/driveways in relation to the retained trees. It would then be advisable to mark out the optimum position of protective fencing on the ground prior to finalisation of any design proposal.

9.3.6 Notices should also be erected on the fencing stating " Protected Area – No operations within fenced area". An example can be found in APPENDIX FOUR, which should be laminated and attached to the fencing at regular intervals.

9.3.7 The positioning of the protective fencing is also very important and should be erected in the proposed location identified on the site plan of APPENDIX FIVE. Once the fence has been erected it should never be crossed and particular care should be taken not to store any materials or soil within the protected area.

9.4 Additional Precautions Outside Fenced Areas

9.4.1 The area between the fencing and the proposed building foundations is to be restricted to pedestrian movements only and ground protection is applied, as recommended in BS 5837 9.3.2.

9.4.2 Foundations within the RPA are to be of those suggested in BS5837 11.6.2 (pile and strip). The piles are to be hand dug with attention given

to roots present. This work should be supervised by an arboriculturalist until the presence or absence of significant roots has been established and appropriate protection given.

9.4.3 Oil, bitumen, cement and other material likely to cause damage to the tree will not be stacked within 10m of the trees stem or within the protective area. Also materials in general will not be stacked or discharged within the exclusion zone.

9.4.4 Concrete mixing and washing will not be carried out within 10m of any retained trees.

9.4.5 Fires will not be lit beneath the foliage or in a position where the flames could extend to within 5m of the foliage, branches or the trunk. If the fire is large then this may necessitate a distance of at least 20m.

9.4.6 Trees that are to be retained will not be used as anchorage for equipment.

9.4.7 Notice boards, telephone cables, or other services will not be attached to any part of the retained trees.

9.4.8 Care should be taken when using cranes or other equipment near the canopy of the retained trees. Also any trees to be felled in proximity to the retained trees should be done so with particular care.

9.5 Services

9.5.1 Where possible all service trenches should be dug outside the Root Protection Area.

9.5.2 Should this not be possible, then the guidelines within 'NJUG 10' *Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees* should be adopted, in particular, Section 4.0, which is included within APPENDIX THREE of this report.

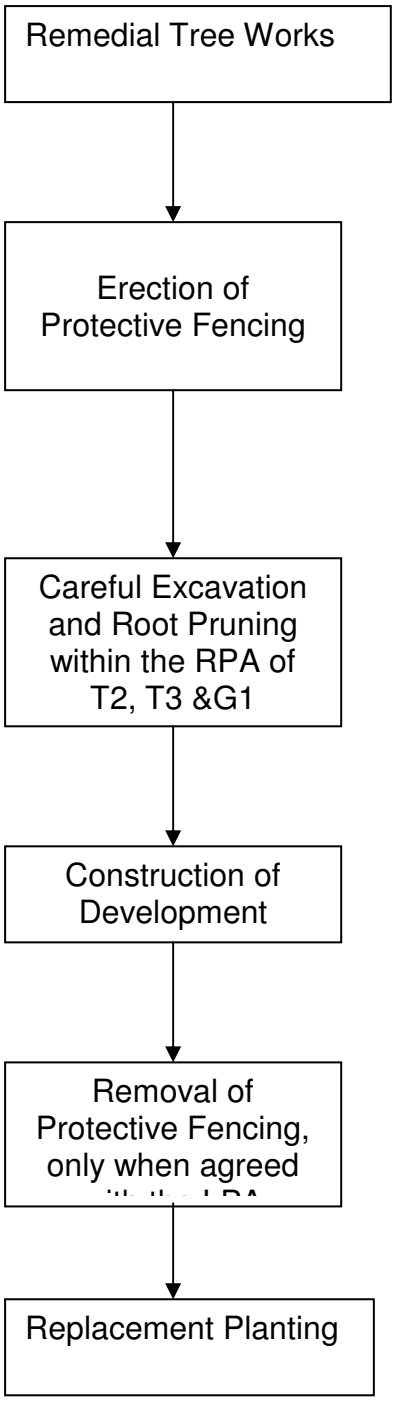
9.6 Replacement Planting

9.6.1 Tree replacement will be carried out in the planting season post development

9.6.2 Bare root stock shall be supported by a single stake and tie, whilst root-balled stock shall have low double staking with a bar and tie. At staking should be to a third the height of the clear stem.

9.6.3 A 0.5m radius of bark chip mulch shall be applied at a thickness of at least 50mm

9.7 Summary of Methodology for the Protection of the Trees



APPENDIX THREE

NJUG 10
Section 4

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees. Telecommunications Code (Schedule 2) Paragraph 19 enables operators to require the lopping of trees which overhang the street and obstruct or interfere with the working of their lines.

4. HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of works. This will reduce the potential for future conflict between the trees and apparatus.

4.1 Below Ground

Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface 600mm, where the majority of roots develop.

4.1.1 Fine Roots

Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer, which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight, where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

4.1.2 Precautions

The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – ‘Tree Protection Zone’

4.1.3 Realignment

Wherever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.

The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees, the owner or their agent) and may depend on the following circumstances;

- The scope of the works (e.g. one-off repair or part of an extensive operation)
- Degree of urgency (e.g. for restoration of supply)
- Knowledge of location of other apparatus
- Soil conditions
- Age, condition, quality and the life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones, there are various techniques available to minimise damage.

Acceptable techniques, in order of preference are;

a) Trenchless
Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited and Precautionary Zones.
In order to avoid damage to roots by percussive boring techniques, it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone, following consultation and by agreement.

b) Broken Trench –Hand-dug
This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c), below. Open sections of the trench should only be long enough to allow the access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside the Prohibited Zone.

c) Continuous Trench – Hand-dug
The use of this method should be considered only as a last resort, if works are to be undertaken by agreement within the Prohibited Zone. The objective being, to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary Zones must be undertaken with great care, requiring closer supervision than normal operations.

After careful removal of the hard surface material, digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fiberous roots) should be retained in situ, without damage. Throughout the excavation works, great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer/arboriculturalist. If, after consultation, severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound possible.

4.1.5 Backfilling
Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: Volume 6 – 'Legislation and Bibliography). In England this relates to the requirements of Openings in Highways' approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out, to avoid direct damage to roots and excessive compaction of the soil around them.

The backfill should, where possible, include the placement of an inert granular material, mixed with top soil or sharp sand (not builder's sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots, securing a local, aerated zone enabling the root to survive in the longer term.

Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted, but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

4.1.6 Additional Precautions near Trees

Movement of heavy, mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.

Where it is absolutely necessary to use mechanical [plant within the Precautionary Zone, care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials, nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way, advice should be sought from the local authority tree offer/arboriculturalist.

See TABLE 1 ‘Prevention of Damage to Trees Below Ground, below for summary details regarding causes and types of damage to trees and the implications to the damage and the necessary precautions to be taken to avoid damage.

APPENDIX FOUR

Site Notice for Protective fencing



TREE PROTECTION AREA
KEEP OUT!

TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND ARE SUBJECTS OF A TREE PRESERVATION ORDER
(TOWN & COUNTRY PLANNING ACT 1990)

CONTRAVENTION OF TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION

THE FOLLOWING MUST BE OBSERVED BY ALL PERSONS:-

- THE PROTECTIVE FENCING MUST NOT BE REMOVED
- NO PERSON SHALL ENTER THE PROTECTED AREA
- NO MACHINE OR PLANT SHALL ENTER THE PROTECTED AREA
- NO MATERIALS SHALL BE STORED IN THE PROTECTED AREA
- NO FUEL SHALL BE DEPOSITED IN THE PROTECTED AREA
- NO EXCAVATION SHALL OCCUR IN THE PROTECTED AREA

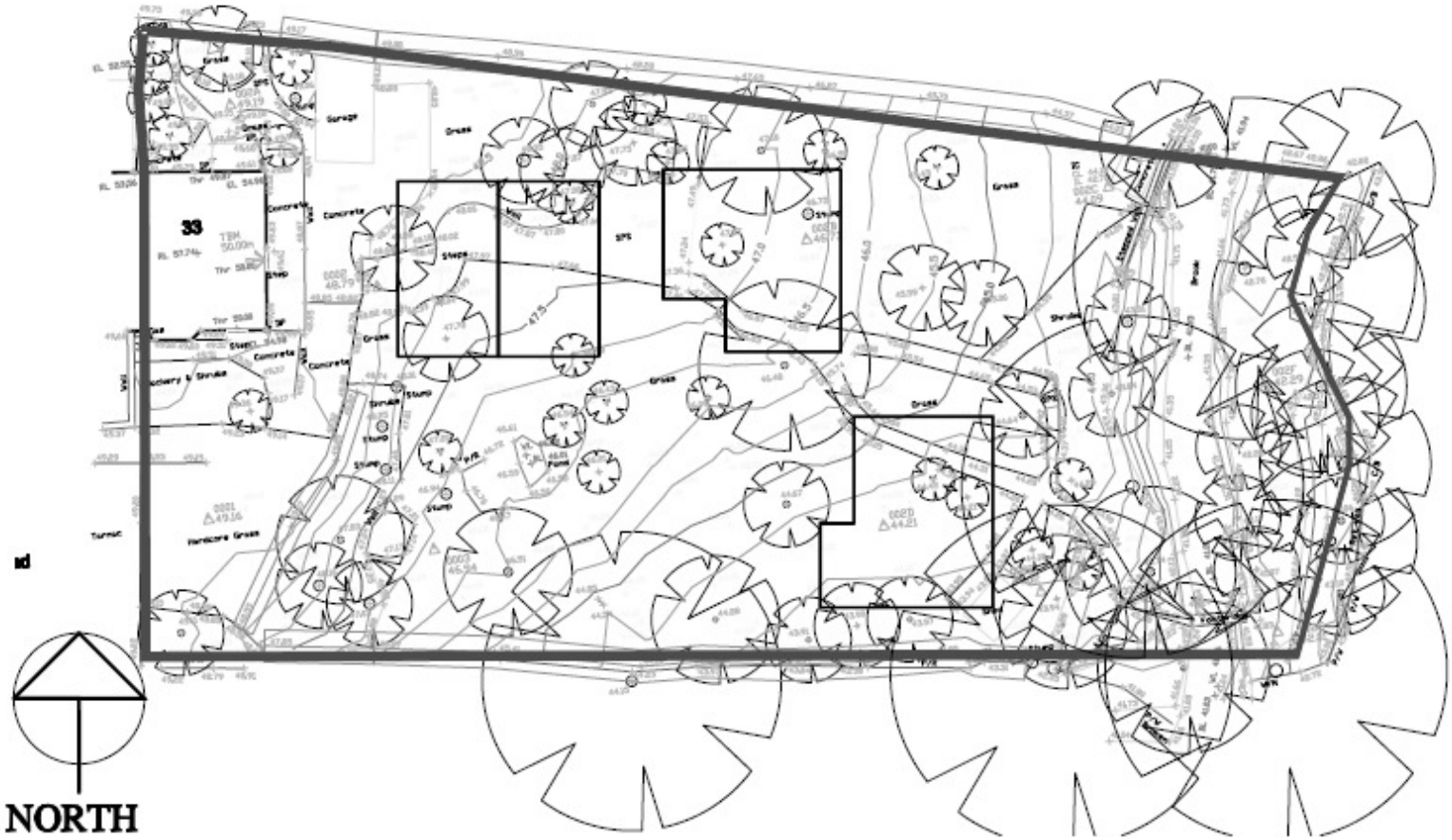
ANY INCURSION INTO THE PROTECTED AREA MUST BE
WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

APPENDIX FIVE

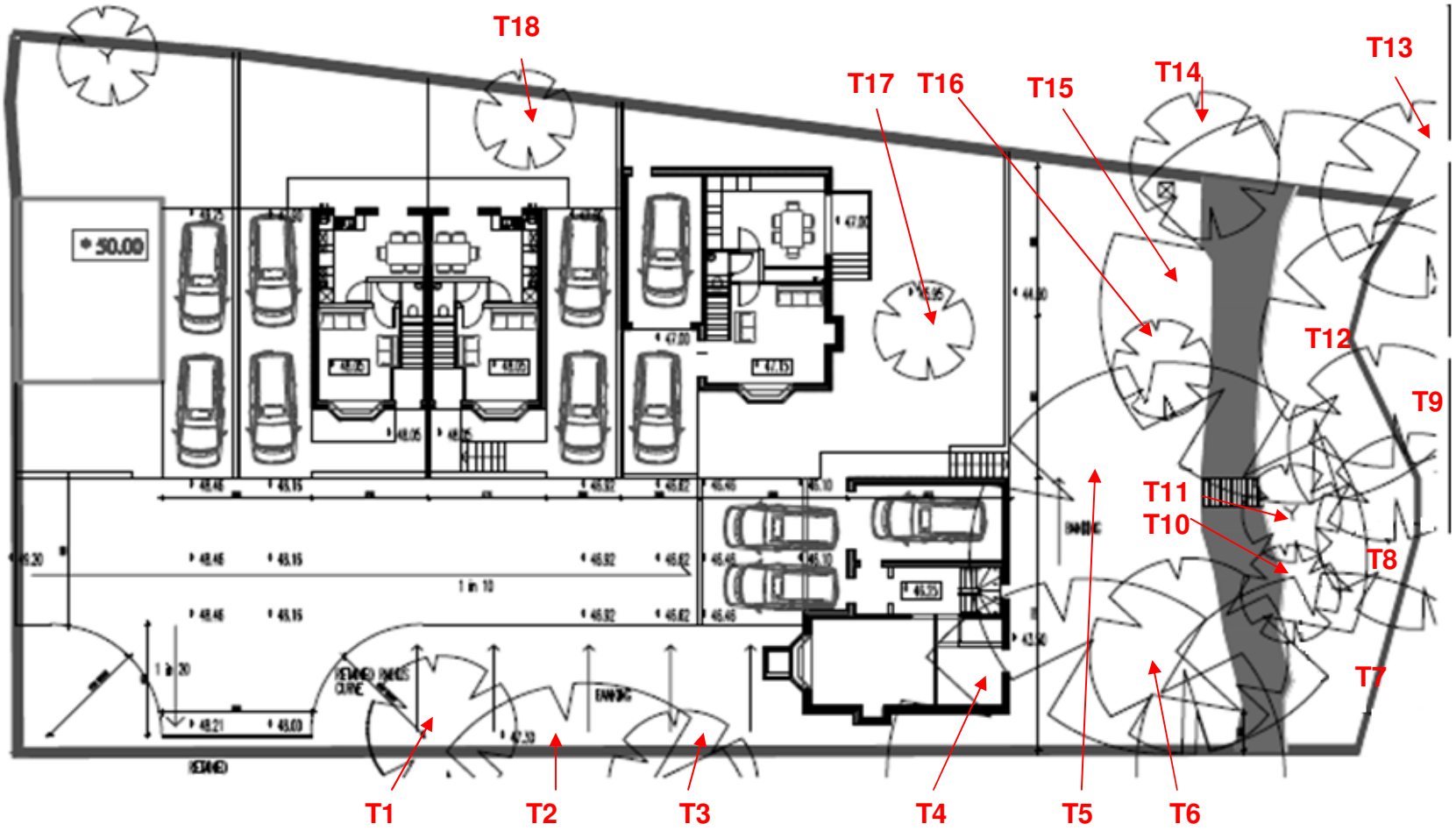
Topographic Plan & All Trees

Site Layout / Retained Trees

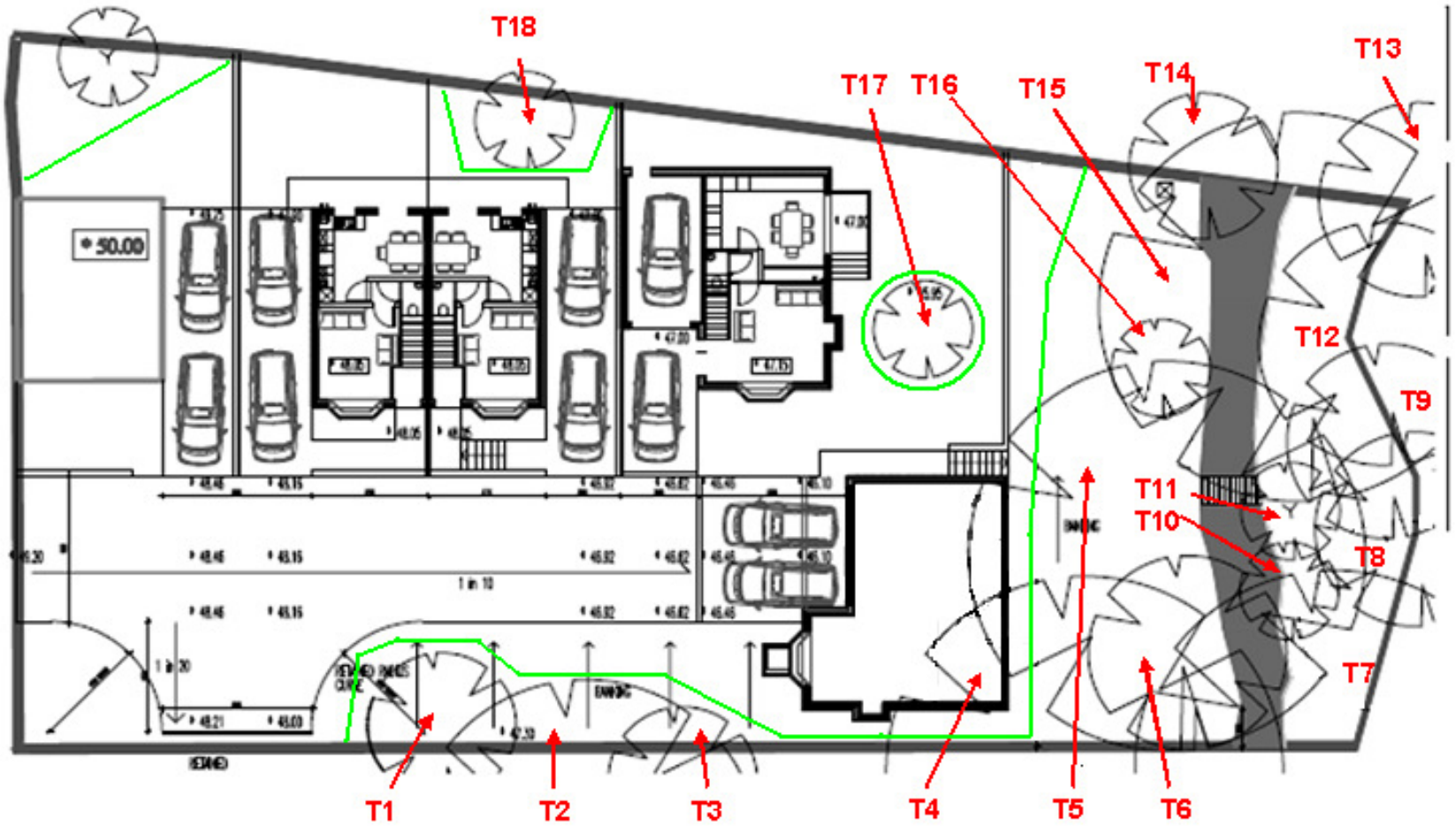
Tree Protection Plan



Above; Topographic plan & plan of all trees



Above ; Plan layout with retained trees.



Above; RPA marked in green, **NB** Tree canopies shown are **NOT** to scale & attention is drawn to the figures in the *Implications Table para 5.5*