

# Arboricultural Report AIA & AMS

JS Design Partnership

Macket's Lane

Liverpool


L25 9NQ

August 2015

U R B A N  
G R E E N



## Quality Management

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## Executive Summary

It is proposed to redesign the external layout of the site to provide additional parking.

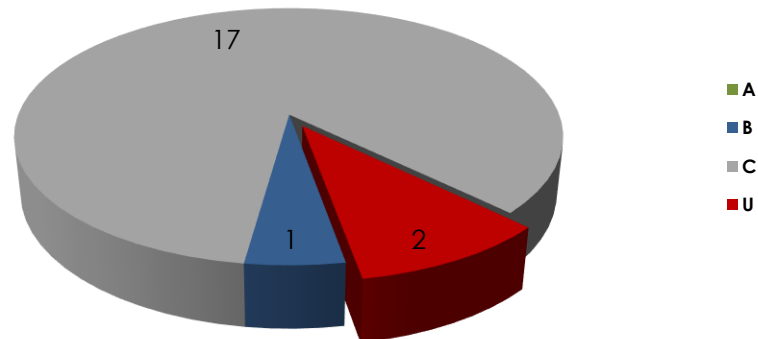
A survey was conducted to BS5837. The condition of all trees on site was assessed and a Retention Category was allocated. Tree positions and Root Protection Areas are plotted on a Tree Constraints Plan.

An Arboricultural Impact Assessment and Method Statement have also been included.

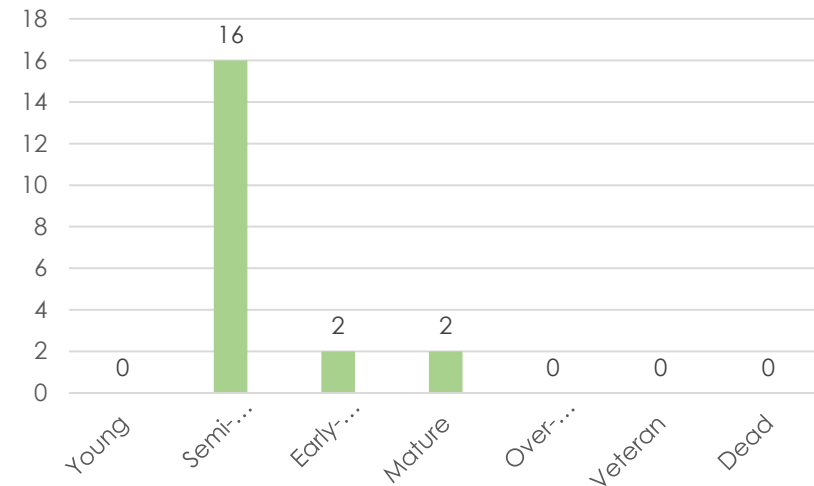
The majority of trees are located adjacent to the site boundary so there is a significant window for development with little impact on trees.

So long as tree protection measures are enforced there is no reason to expect any significant arboricultural impact since the retained trees are situated away from the proposed development.

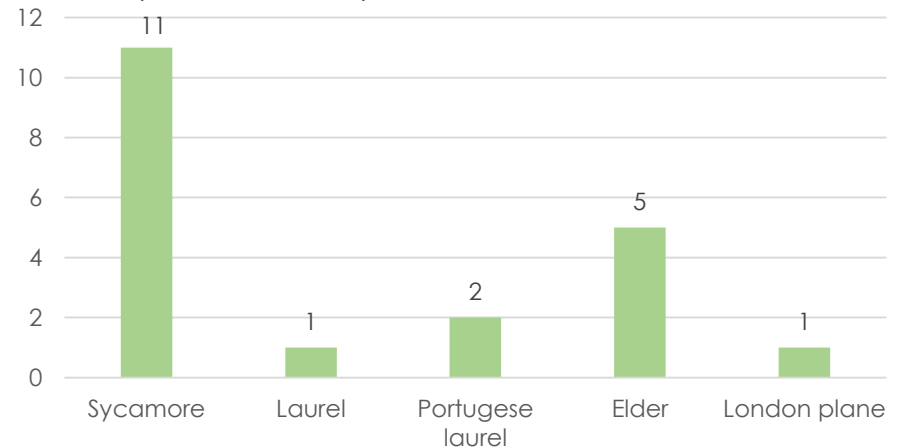
Retention Categories



Age Distribution



Species Diversity



# 1 Introduction

## 1.1 Instructions and references

All trees, regardless of their statutory status, are a material consideration in a planning application. It is therefore essential that the potential effects of any Proposed Development on existing trees are fully assessed.

We have been instructed by JS Design Partnership to carry out an Arboricultural Survey to British Standard 5837:2012 guidelines at the site location and produce our findings in a report. We have also been instructed to provide an Arboricultural Impact Assessment to evaluate the impact on trees present and an Arboricultural Method Statement to provide detailed guidance on the protection of retained trees throughout the construction process.

Measurements have been taken on site in order to plot the positions of trees. A Leica Disto D5 Laser Measurer was used to measure tree positions from the existing building. These measurements were then plotted onto the existing plans provided in CAD format.

A plan outlining the development proposals have been used to form the basis of the Arboricultural Impact Assessment.

## 1.2 Scope and limitations of the report

The report is designed to accompany a planning application following guidance set out in BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations.

The Arboricultural Impact Assessment (AIA) will appraise the Proposed Development in relation to its effect on surveyed

trees and any potential impact on local amenity by appraising the following:

- Soil compaction in Root Protection Areas (RPAs).
- Installation of hard services including drives and paths.
- Potential physical damage to roots, stems and aerial parts of trees.
- Removal or pruning of trees.

The impact assessment will also appraise the effect that the retained trees may have on the development such as potential nuisance caused by excessive leaf/fruit litter, lighting levels within the proposed building and grounds and the potential damage to structures.

The Arboricultural Method Statement (AMS) is designed to advise on tree management and protection during the planning process.

All processes that have the potential to impact on trees should be considered in the wider project management of the site. This can be done by instructing an arboricultural consultant as part of the management team. This will ensure that any works that can affect trees will be monitored and supervised throughout the project.

The report is based upon a visual inspection. The consultant shall not be responsible for events that happen after the date of the report due to factors that were not apparent at the time, and the acceptance of this report constitutes an agreement with the guidelines and the terms listed in this report.

Any defects seen by a contractor or the employer that were not apparent to the consultant must be brought to the consultant's attention immediately.

The consultant accepts no liability in respect of the trees unless the recommendations of this report are carried out under his supervision.

Any physical alterations to site conditions subsequent to this report may have the potential to change/invalidate the findings and recommendations of this report.

Assessing the potential influence of trees upon load bearing soils, beneath existing and proposed structures resulting from water abstraction by trees or rehydration of shrinkable soils was not included in the contract brief and is therefore not considered in the report. The consultant cannot be held responsible for damage arising from such action.

Trees have the potential to cause indirect damage to existing and proposed structures by desiccation of the soil. Where soils are suspected to be shrinkable, they should be analysed by laboratory testing to determine the plasticity index. This will allow management decisions to be made relating to foundation depths, new planting and the effect of tree removals.

Potentially hazardous trees are highlighted and appropriate recommendations are made. However, this report should not be seen as a substitute for a full tree risk assessment or management plan which are specifically designed to minimise risk and liability associated with responsibility for trees.

## 2 Site Overview

### 2.1 Location

The site is situated in a high density residential area (figure 1). The co-ordinates are 53°22'27.22"N, 2°51'12.81"W, the OS reference is SJ 4331086714 and the altitude is 35 above sea level.

The survey was limited to the area shown in Figure 2 which is sufficient to consider the impact of the proposals.

Figure 1



Figure 2



### 2.2 Tree condition and recommendations

The recommendations found in the Tree Data Schedule in Appendix 1 are based on assessments from a health and safety perspective and are made regardless of the Proposed Development. For details regarding trees in relation to the proposed development please refer to the Arboricultural Impact Assessment.



## 2.3 Summary of findings

Trees that are potentially hazardous and will require removal in order to prevent potentially significant damage due to tree or limb failure are T3 and T5. These works should be prioritised as indicated on the Tree Data Schedule.

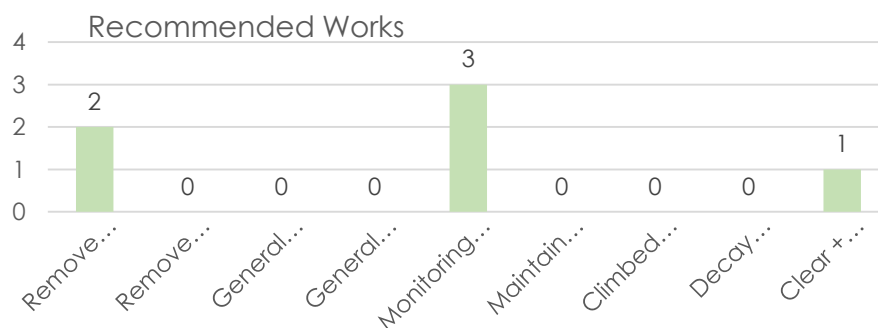
Trees which are considered to be in an acceptable condition at present but which have defects that require monitoring include T1, T2 and T12. The Tree Data Schedule indicates the recommended inspection frequency.

T7 could not be fully inspected due to the presence of dense ivy, undergrowth or limited access. It is recommended that the ivy or undergrowth is removed or access is facilitated.

All other trees are deemed to be in an acceptable condition and no further works have been recommended.

## 2.4 Work priority and future management

The Tree Data Schedule in Appendix 1 details what works are required to individual trees in order to ensure that they are in an acceptable condition. The chart below summarises these works:



The following table suggests a schedule for prioritising works required to individual specimens, as outlined in the Tree Data Schedule in Appendix 1, in order to ensure that the associated risks are abated:

Priority	Definition	Tree Number
<b>Urgent</b>	As soon as possible	None
<b>Very High</b>	Within 1 Month	None
<b>High</b>	Within 3 Months	T7
<b>Moderate</b>	Within 1 year	T1, T2, T3, T5, T12
<b>Low</b>	Within 3 years	None

Upon completion of any recommended works, the trees will be in an acceptable condition from a health and safety perspective. However, they should be regularly inspected according to the following suggested schedule:

Inspection Frequency (years)	Tree Number
<b>0.5</b>	None
<b>1</b>	T1, T2, T3, T5, T7, T12
<b>1.5</b>	None
<b>3</b>	G4, T6, T8, T9, T10, T11, T13, T14, T15, T16, T17, T18, T19, T20

## 2.5 Tree protection status

At the time of writing the report, we have not yet received a response from the Local Planning Authority to our request regarding the status of trees on or adjacent to the site.



## 2.6 Tree protection – general advice

It is recommended that the local authority is consulted before any tree works are undertaken, as new TPOs may have been created since the time of enquiry, and heavy fines exist for unauthorised works to protected trees.

A TPO can be overridden by planning consent, where tree removal is necessary to enable the Proposed Development to proceed.

All works to protected trees require consent from the local authority, including pruning. However, this does not include the removal of dead wood, which is exempt. Although dead and dangerous trees are exceptions to a TPO, it is advisable to give the local authority five days' notice in writing of any intended removal.

It is an offence to remove more than 5m<sup>3</sup> of timber in any one calendar quarter without having first obtained a felling licence from the Forestry Commission. It must be noted, however, that this excludes sites where planning permission has already been granted.

## 2.7 Tree works

All specified tree work is to be carried out in accordance with BS 3998:2010 Tree work - Recommendations by a professional and specialist arboricultural contractor, who carries the appropriate experience and insurance cover.

## 2.8 Wildlife

Prior to the commencement of any tree works, the trees should be assessed for the presence of protected species, some of which are subject to the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. Where there is evidence that bats, birds or

other protected species are present, the statutory nature conservation organization needs to be consulted prior to commencement of any tree work operations.

## 3 Arboricultural Impact Assessment (AIA)

### 3.1 Summary of the development

It is understood that the site external layout will be redesigned to provide additional car park bays for the site. This can be seen on the plans included in Appendix 4.

### 3.2 Tree constraints

BS 5837:2012 recognises that conflicting requirements of the planning system for development means that trees are only one factor which need to be taken into consideration. Although there may be certain specimens that can pose significant constraints to development due to their importance, it is essential that inappropriate tree retention is avoided.

### 3.3 Summary of impact on trees

Trees can be adversely affected on development sites if their protection is not factored into the wider project management of onsite operations. We have transposed the tree survey plan over plans detailing current proposals in order to assess the impact on surveyed trees.

### 3.4 Impact of tree loss

In order to facilitate the development it is necessary to remove a moderate amount of trees. Several trees have also been marked for removal as part of landscape improvements. It is recommended that all tree loss is mitigated in accordance with Local Authority requirements within the landscape proposals.

### 3.5 Impact of general construction activity

Tree protection fencing will need to be erected before any construction activity takes place to avoid damage to trees directly by mechanical damage or indirectly due to soil compaction in the Root Protection Areas (RPAs).

It is not always practical to fence off the complete RPAs, therefore special care is required in the areas not protected by temporary protective fencing, as indicated on the Tree Protection Plan in Appendix 4, to avoid soil compaction.

It is essential that all site personnel, including temporary contractors, are made aware of the recommendations within this report.

### 3.6 Changes in ground surfaces

The construction of the additional parking bays will encroach on the RPA of several retained trees. In order to ensure that there is no significant root loss it is recommended that a cellular confinement is utilised in the RPA of retained trees.

The four general principles that will require strictly upholding when designing a no dig solution within the RPA are:

- Roots must not be severed.
- Ground Levels must not be changed.
- Soil structure must not be damaged by compaction.
- Oxygen and water must be able to diffuse into the soil below.

A cellular confinement system acts to “spread the load” on soft ground by distributing the load of a wheel/track/footfall over a larger surface area. This cellular system should then be filled with no-fines granular sub-base material that can penetrate the

cells with a geotextile layer below to prevent the loss of aggregate. This interlock between aggregate and grid provides a reinforced platform.

At this stage we are unable to provide detailed specifications for the design of the cellular confinement system. This should be carried out in consultation with an engineer and to manufacturers' specifications which can advise on the necessary load bearing capacity of the structure and the correct installation methods. Please note that methodology used to install the cellular confinement system must avoid the use of machinery or heavy plant within the RPA.

The majority of tree roots are found in the upper 600mm of the soil profile. Rooting conditions become less favourable at depth due to less oxygen availability and nutrient content where organic matter decreases.

For good soil health, there needs to be a constant supply of air and water available to roots to allow successful plant functioning. The structure of a healthy soil has sufficient air space between the soil particles; when compaction is applied, the air spaces get squeezed out, leading to anaerobic conditions and a reduction in the soils ability to hold onto vital water and nutrients.

## 4 Arboricultural Method Statement (AMS)

### 4.1 Summary of the impacts identified

The following impacts have been identified during the AIA and will be discharged within this AMS:

- Tree loss
- Changes in ground surfaces

### 4.2 Development implementation phases

The arboricultural consultant may need to be involved in some or all of the following processes.

Phase of Development	Arboricultural input
<b>Phase 1 - Site preparation</b>	<ul style="list-style-type: none"> <li>• Pre-construction tree surgery works</li> <li>• Access facilitation pruning</li> <li>• Demolition of existing structures</li> <li>• Installation of protective fencing and ground protection</li> <li>• Pre-development inspection</li> </ul>
<b>Phase 2 – Construction process</b>	<ul style="list-style-type: none"> <li>• Demolition of existing structures</li> <li>• Foundations in the RPA</li> <li>• Installation of services</li> <li>• Working in the RPA</li> </ul>

	<ul style="list-style-type: none"> <li>• New surfaces in the RPA</li> <li>• Hard landscaping</li> </ul>
<b>Phase 3 – Post-construction</b>	<ul style="list-style-type: none"> <li>• Removal of protective fencing</li> <li>• Soft landscaping</li> <li>• Signing off</li> </ul>

### 4.3 Phase 1 – Site preparation

### 4.4 Tree surgery works

Tree works that are recommended in the Tree Data Schedule in Appendix 1 are of a general maintenance nature and can be carried out at any time as per recommendations.

Tree works required to facilitate the development will be carried out prior to the commencement of any onsite operations. This should allow sufficient space for approved construction to be carried out. For further details regarding the pruning of trees for the facilitation of the development please refer to Arboricultural Impact Assessment.

Any unforeseen tree works that become apparent during the construction process will require written consent from the Local Authority Tree Officer.

### 4.5 General construction activity

All operations that could affect trees on and adjacent to the site must be considered as part of the project management of the Proposed Development. It is therefore imperative that an Arboricultural Consultant is appointed as part of the design and management team to advise on pre-development issues and supervise on-site operations.

The Arboricultural Consultant may also have an advisory role in the preparation of site including tree surgery works and the protection of trees during demolition processes.

The AMS accompanies the AIA and should be read in conjunction with the Tree Protection Plan. It is essential to adhere to the recommendations within this document during on-site operations to ensure the successful retention of trees as part of the Proposed Development. Compliance with the AMS will be a requirement of all relevant contracts associated with the Proposed Development.

The AMS aims to provide general guidelines to onsite personnel that must be followed when working close to trees on construction sites. All site personnel should have access to this document and be made aware of any sections that may be relevant to their specific area of work.

The developer will inform the Local Planning Authority (LPA) within twenty four hours if the Arboricultural Consultant is replaced.

#### 4.6 Potential damage to above ground parts of retained trees

Care will be taken when planning site operations to ensure that wide or tall loads or plant with booms, jibs and counterweights are able to operate without coming into contact with retained trees. Any contact has the potential to cause life limiting damage. It is therefore essential that any activities in close contact with retained trees is carried out under the supervision of a banksman to maintain sufficient clearances.

Any tree damage must be reported to the Arboricultural Consultant or Local Authority Tree Officer as unreported damage could lead to the structural instability.

#### 4.7 Protective fencing

Temporary protective fencing will need to be installed in the positions indicated on the Tree Protection Plan in Appendix 4 prior to the commencement of any construction activities on site including the delivery of materials and site facilities.

Any fencing that is damaged so that it is no longer able to protect retained trees must be replaced/repaired immediately with appropriate fencing.

All RPAs will be protected by 'Heras' steadfast type fencing with back stay supports where construction activity is expected to be minimal. (Fig 3. below)

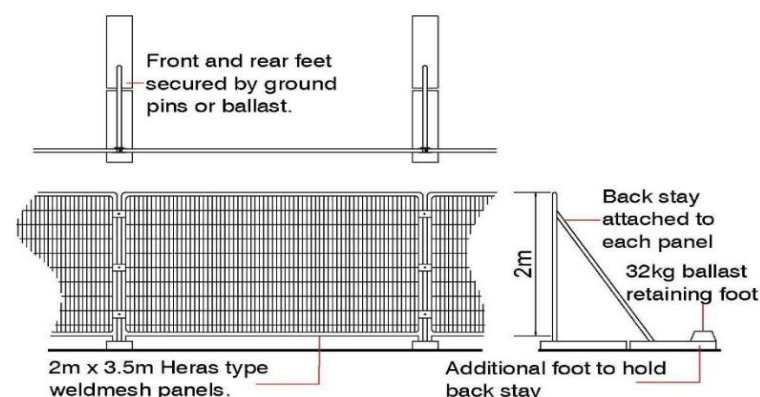


Fig 3. Temporary Protective Fencing with back stay supports

In areas of site where construction activity is expected in close proximity to RPAs, it will be necessary to employ the more robust 'in-ground' system following BS 5837 guidelines. (Fig 4. below)

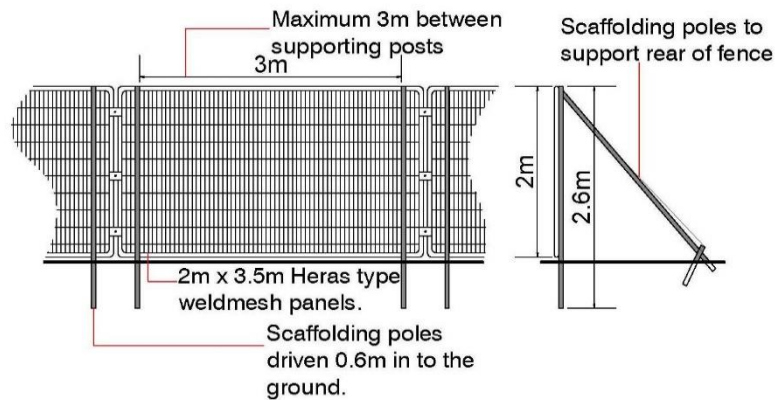


Fig 4. Temporary Protective Fencing

The 'in-ground' system involves driving vertical scaffold poles approximately 0.6m into the ground onto which are affixed horizontal scaffold poles and bracing struts. 2m high anti-climb weldmesh panels are then wired to the scaffold framework. The vertical scaffold poles should be at a maximum of 3m apart.

No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to the tree roots when locating uprights.

Where space is limited, it is sometimes necessary to construct a temporary tree guard to physically protect the main stem of the tree (Fig 5. below). This should be made by joining together 4 X 25mm Exterior Grade pieces of plywood to 47mm X 47mm treated timber posts to create a box shaped frame which is attached to the ground or adjacent structures. No fixings are to be made to the tree and suitable ground protection should be employed within the RPA of the tree.

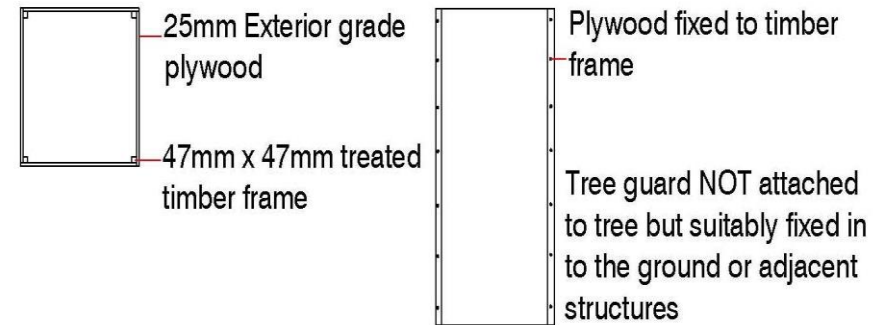


Fig 5. Temporary Protective Fencing.

A 600mm x 300mm warning sign reading "TREE PROTECTION AREA KEEP OUT" shall be fixed to every 10m of protective fencing. (Fig 6. below).



Fig 6. Tree Protection Sign



## 4.8 Ground protection for wheeled or tracked vehicles

All vehicles will use existing hard surfaces. However, it may be necessary on occasion to drive plant machinery within the RPA. To avoid compaction of the soil during construction, a minimum of 100mm compressible material, followed by temporary interconnected road plates or similar that is capable of sustaining the expected loads should be installed. This system will ensure that the weight is evenly distributed over the affected area.

## 4.9 Ground protection for pedestrians or light vehicles

The primary method of ground protection is the installation of a compressible layer (e.g. woodchip) over a geotextile fabric with side butting scaffold boards. (Fig 7. below)

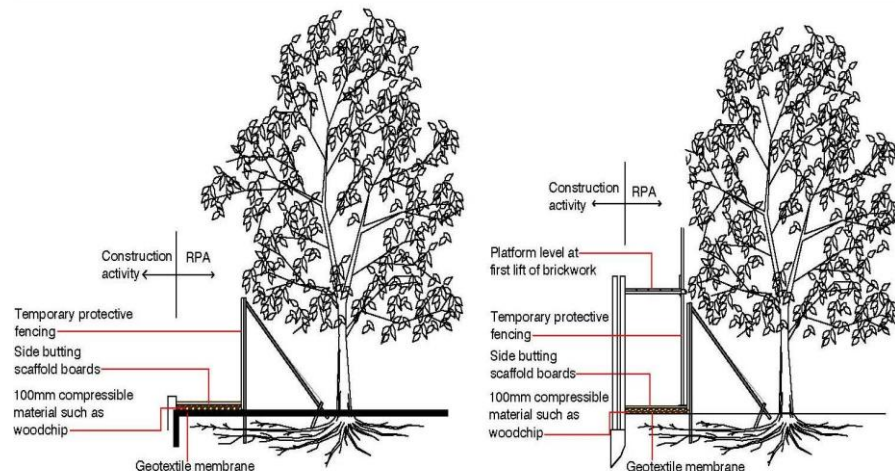


Fig 7. Ground Protection in RPA

Ground protection measures whilst working the RPA must be capable of supporting the expected loads and avoid compaction of the soil.

The boarding will be left in place until the construction works are finished.

Scaffolding may first be erected with the uprights on spreader boards and the ground protection installed around the uprights.

## 4.10 Pre-development inspection

The site will be inspected by the appointed Arboricultural Consultant or Local Authority Tree Officer following any facilitative tree surgery works and the installation of protective fencing and ground protection measures.

## 4.11 Phase 2 – Construction process

## 4.12 Demolition and removal of surfaces in the RPA

During demolition, the following restrictions will apply:

- Where direct damage by falling masonry is likely, the tree should be protected by exterior grade plywood sheets constructed around the main stem.
- The main body of any mechanical excavator will operate outside the RPA.
- Masonry will be pulled away from trees where possible.
- When breaking masonry, a fine water spray will be used to minimise dust particles.
- Excessive dust particles on trees will be removed each day by spraying with water.



Hard surfaces should be kept in place for as long as possible during construction works in order to prevent soil compaction in the RPA.

During surface removal, the following restrictions will apply:

Only hand operated tools will be used to lift existing surfaces and sub-base. No mechanical excavators are to be used.

No excavation below the existing sub-base will occur.

All surface removal within the RPA will be supervised by the Arboricultural Consultant or the Local Authority Tree Officer.

#### 4.13 Excavation in the RPA

Any necessary excavation must be carried out using hand tools to avoid direct damage to the protective bark of tree roots. It may be possible in some instances to use specialised equipment such as high air pressure machinery to excavate the soil with minimal disturbance to roots.

Exposed roots will be wrapped in dry, clean Hessian sacking to prevent desiccation and to protect from rapid temperature changes. In warmer weather, the sacking should be kept moist by regular watering. Sacking should be removed before backfilling.

Roots less than 25mm diameter may be pruned back, preferably to a growing point. A sharp cutting tool such as bypass secateurs or a handsaw should be used to leave the smallest wound possible. Roots greater than 25mm in diameter should be retained wherever possible.

Root pruning should be carried out under the supervision of the Arboricultural Consultant or the Local Authority Tree Officer to ensure that only roots necessary to facilitate the development

will be removed and the long-term well-being of retained trees is maintained.

Backfilling of any excavation should be carried out by hand to avoid direct root damage by excessive compaction and should include, where possible, the replacement of inert granular material mixed with sharp sand (not builder's sand) around retained roots.

#### 4.14 Temporary site cabins

All storage facilities and deliveries will make use of existing hard surfaces to avoid unnecessary compaction within RPAs. The locations will be agreed in writing with the LPA prior to delivery and will remain in the agreed locations unless approved by the LPA.

If storage facilities require siting within RPAs, every effort will be made to ensure that any damage to aerial parts of retained trees is avoided and that appropriate footings are used to avoid root damage or compaction of the soil.

#### 4.15 New structures in the RPA

No concrete strip foundations are to be installed within the RPA of any retained tree. Traditional strip foundations can cause an unacceptable amount of damage during the excavation process where roots are easily torn by mechanical excavators.

Small, light structures such as sheds and bin stores can be laid directly onto the soil surface without the need for significant excavation. A small amount of excavation may be permissible to provide a level surface, however, no roots over 25mm in diameter should be severed without the advice of an arboriculturist or Local Authority Tree Officer.

Traditional footings should not be used within the RPA for the construction of non-load bearing walls. It may be possible however, to construct walls in proximity to trees by bridging existing roots with lintels.

Where foundations are to be laid in the RPA of retained trees, root damage can be minimized by using small diameter piles located to avoid major tree roots. The proposed area for pile installation should be dug by hand to a depth of approximately 750mm in order to ascertain the position of roots present. Beams, slabs and suspended floors should be laid at or above ground level and cantilevered, as necessary, to avoid tree roots.

Where piling is to be installed in proximity to trees, the smallest practical pile diameter should be used as this reduces the possibility of striking major tree roots, and reduces the size of the rig required to sink the piles. The latter is particularly important where piling within the branch spread is proposed, as mini-rigs reduce the need for access facilitation pruning. Sheathed piles protect the soil and adjacent roots from the potential toxic effects of concrete.

Backfilling of any excavation should be carried out by hand to avoid direct root damage by excessive compaction and should include, where possible, the replacement of inert granular material mixed with sharp sand (not builder's sand) around retained roots.

Any pruning should be carried out under the supervision of the Arboricultural Consultant or the Local Authority Tree Officer to ensure that only branches necessary to facilitate the Proposed Development will be removed and the long-term well-being of retained trees is maintained.

#### 4.16 Utilities

All services will need to be designed to avoid the RPAs of retained trees including foul and surface water drains, electricity, land drains telephone and cable services, soak-aways, lighting, gas and water.

The installation of underground utilities within the RPA should not be considered unless it is absolutely necessary. Trenching can cause an unacceptable amount of damage to tree roots.

The National Joint Utilities Group publication, NJUG10 recommends the following precautions when working in the RPA:

- No excavation should be carried out using machinery.
- When digging by hand, carefully work around roots, retaining as many as possible.
- Do not sever roots over 25mm in diameter without the consent of the Arboricultural Consultant or Local Authority Tree Officer.
- Any root pruning will be carried out using a sharp tool (eg secateurs or handsaw). Make a clean cut and leave as small a wound as possible.
- Backfill the trench with an inert granular material and topsoil mix. Compact the backfill with care around the retained roots. On non-highway sites backfill only the excavated soil.
- Do not repeatedly move or use heavy mechanical plant except on hard standing.
- Do not store spoil or building material, including chemical and fuels.
- Protect roots with dry sacking if they are to be left exposed overnight when there is a risk of frost. Sacking must be removed before backfilling.

#### 4.17 Working in the RPA

Special care will need to be undertaken when working in the RPAs that are not protected by temporary fencing. The RPA is defined on the Tree Protection Plan Appendix 4 by coral hatched circles surrounding retained trees. Where necessary, temporary protective fencing will be placed in the marked positions, beyond which is a Construction Exclusion Zone (CEZ). This zone precludes all construction activity, with the sole exception of specified arboricultural works that have been agreed by all parties and under the supervision of an arboriculturist.

#### 4.18 RPAs explained

The RPA is an area of ground around the base of a retained tree, which is calculated in relation to the stem diameter, where disturbance should be kept to a minimum and avoided if at all possible.

The majority of tree roots grow within the upper 600mm of the soil profile where most nutrients are available as the result of the decomposition of organic matter close to the surface. Rooting conditions become less favourable at depth as the soil density increases, creating anaerobic conditions.

It is essential that roots are protected from construction works including physical damage from excavation and changes in soil structure from compaction and changes in ground levels.

#### 4.19 Construction Exclusion Zone (CEZ)

No construction activity will take place unless otherwise stated in this report or agreed in writing with the LPA prior to required works. Any required works will be carried out under the

supervision of the Arboricultural Consultant or Local Authority Tree Officer

Any materials which have the potential to contaminate the soil, e.g. concrete mixing and diesel oil will not be discharged within 10m of the tree stem. This should take into consideration the topography of the site and slopes, to avoid materials such as concrete washings flowing towards retained trees.

Fires shall not be lit in a position where their flames can extend to within 5m of foliage, branches or trunk. This will depend on the size of the fire and the wind direction.

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

#### 4.20 Surface design

It is essential to maintain adequate supplies of water and oxygen for trees through the soil. New impermeable surfacing should not cover more than 20% of the RPA.

Design and construction specification should take account of further growth.

Paving slabs and block pavers are available with built in infiltration spaces between the slabs or blocks. They should be laid dry-jointed on a sharp sand foundation to allow air and moisture to penetrate to the rooting area.

It may be necessary to lay paving and other surfaces on a flexible base to allow movement and to facilitate relaying if distortion becomes excessive due to the activity of tree roots.

Edgings and associated foundations and haunchings can damage tree roots. This should be avoided within the RPA by

either the use of alternative methods of edge support or by not using supports at all.

Where wheeled or heavy pedestrian traffic is expected in the RPAs of retained trees, it will be necessary to construct the new surface using a cellular confinement system with a permeable surface. A supplementary method statement will be included in the appendices if necessary.

#### 4.21 Changes in ground level

Changes in ground level can be harmful to trees where stripping or filling of soil is carried out in the RPA. It is therefore important that no significant changes in level occur within the RPA of retained trees.

#### 4.22 Pedestrian Paving

Any pedestrian paving or patios that may be installed over rooting zones, as part of a post construction landscaping scheme, should be constructed in a manner sympathetic to tree roots. Excavation should be limited to 100mm. Paving with a thickness of 50mm bedded on mortar, or sand bearing directly onto the ground, with a finished surface which is level with existing ground levels will be acceptable. No retaining kerbs should be used.

#### 4.23 Boundary treatments

Where fencing is to be installed within RPAs of retained trees, post holes will be excavated by hand and kept as narrow as possible. Trial holes will be dug using a manually operated soil augur in order to position post holes to avoid major roots.

Exploratory post holes will be dug before committing to positions. If any roots in excess of 25mm are encountered they are to remain intact and the post hole will be relocated to avoid them. The fencing system must permit such flexibility (i.e. where fixed panel widths are used, all post holes must be excavated before committing to the final location)

All post holes will be excavated by hand and kept as narrow as possible (maximum diameter 300mm).

Any roots in excess of 10mm which are severed will be neatly pruned back with secateurs. This will encourage healing and reduce the likelihood of infection.

#### 4.24 Soft landscaping

No machinery used for landscaping such as rotovators are to operate within the RPAs of retained trees.

All planting must be carried out carefully, by hand to avoid damage to existing roots. Mulch should be used around the base of trees, where possible, to maintain ground level and to avoid mower and strimmer damage to buttresses and surface roots.

#### 4.25 Monitoring

The Arboricultural Consultant will be responsible for the monitoring of all arboricultural works and issuing a certificate of practical completion.

A record of site visits will be maintained for inspection on site and copies forwarded to the developer/agent and to the LPA.

## 4.26 Phase 3 – Post development








### 4.27 Removal of protective fencing and signing off

When the construction process is complete, the site should be inspected by the appointed arboriculturist or Local Authority Tree Officer. This must be prior to the removal of temporary protective fencing.









Any proposed landscaping operations by heavy machinery should be carried out before the protective fencing is removed.

## Appendix 1 - Tree Data Schedule

- The following pages contain information gathered during the site survey.
- The reader should refer to Appendix 2 in order to correctly interpret the tree data.
- All images within the Tree Data Schedule are diagrammatical only. Their purpose is to indicate, at a glance, the relative dimensions of each tree. The images are computer generated based on measurements recorded for stem diameter, crown spread, crown height and overall height.

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (mm)	Crown Spread (m) W N E S	Scaled Tree Diagram (m)	Notes	Recommendations		Physiological Condition	Life Expectancy (yrs)
								Priority	Inspect Freq (yrs)	Structural Condition	Retention Category
T1	Sycamore  Acer pseudoplatanus	13	5	740	5 7 6		1: Multiple pruning wounds (healing well). 2: Multi stemmed at base with tight unions. 3: Basal unions likely to fail in the future. 4: Causing damage to paving.	Monitor branch union.		Good	10-20
								Moderate	1	Poor	C
T2	Sycamore  Acer pseudoplatanus	10	2	370	7 6 6		1: Situated in close proximity to building. 2: Previous pruning wounds evident. 3: Likely to cause damage in the future. 4: Acceptable condition at present.	Monitor.		Good	10-20
								Moderate	1	Fair	C
T3	Sycamore  Acer pseudoplatanus	7	1	250	1.5 1 3		1: Cavity present on main stem. 2: Situated in close proximity to building. 3: No long term future.	Remove.		Fair	<10
								Moderate	1	Very Poor	U
G4	Semi-Mature  Laurel  Prunus laurocerasus	av 4.5	av 0.1	av 70	av 2 2 2 each		2: Scattered throughout site.	No action required.		Good	40+
								n/a	3	Good	C
T5	Sycamore  Acer pseudoplatanus	8	2	260	4.5 3 3.5		1: Situated in close proximity to building. 2: No long term future.	Remove.		Fair	<10
								Moderate	1	Fair	U
T6	Mature  Portugese Laurel  Prunus lusitanica	7	2	320	5 5 3		1: Previous pruning wounds evident. 2: Poor form. 3: Acceptable condition at present.	No action required.		Fair	10-20
								n/a	3	Fair	C
T7	Early-Mature  Sycamore  Acer pseudoplatanus	10	2	830	6.5 5.5 4.5		1: Multi stemmed at base with one poor union. 2: Dense ivy prevented a detailed inspection. 3: Potential for failure of one limb due to poor union.	Remove ivy and re-inspect for defects.		Fair	10-20
								High	1	Poor	C



Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (mm)	Crown Spread (m) N W S E	Scaled tree Diagram (m) 	Notes	Recommendations		Physiological Condition	Life Expectancy (yrs)
								Priority	Inspect Freq (yrs)	Structural Condition	Retention Category
T8	Semi-Mature <b>Sycamore</b>  Acer pseudoplatanus	10	2.5	160	3.5 1 3.5		1: Suppressed specimen. 2: Ivy present at base. 3: Previous pruning stubs evident. 4: Acceptable condition at present.	No action required.		Fair	40+
	n/a							3	Fair	C	
T9	Semi-Mature <b>Sycamore</b>  Acer pseudoplatanus	10	3	230	3.5 2 4		1: Single stemmed and leaning with a slightly unbalanced crown. 2: Slightly suppressed specimen. 3: Acceptable condition at present.	No action required.		Good	40+
	n/a							3	Good	C	
T10	Semi-Mature <b>Sycamore</b>  Acer pseudoplatanus	10.5	3	300	2.5 3 4		1: Multi stemmed at 1m with tight unions. 2: Ivy present at base and throughout crown. 3: Acceptable condition at present.	No action required.		Good	40+
	n/a							3	Good	C	
T11	Semi-Mature <b>Elder</b>  Sambucus nigra	5.5	1	150	1.5 1.5 1.5		1: Small insignificant specimen.	No action required.		Good	40+
	n/a							3	Good	C	
T12	Semi-Mature <b>Sycamore</b>  Acer pseudoplatanus	11	2	420	5.5 4 5		1: Bifurcates at 1m with poor union. 2: Situated in close proximity to boundary fence. 3: Acceptable condition at present.	Monitor branch union.		Good	40+
	Moderate							1	Fair	C+	
T13	Semi-Mature <b>Sycamore</b>  Acer pseudoplatanus	9.5	2	280	3.5 1 3.5 4		1: Bifurcates at base. 2: Unbalance crown due to suppression from neighbouring tree. 3: Situated in close proximity to boundary fence. 4: Acceptable condition at present.	No action required.		Good	40+
	n/a							3	Good	C	
T14	Semi-Mature <b>Elder</b>  Sambucus nigra	5	1	200	1.5 1.5 1.5		1: Small insignificant specimen.	No action required.		Fair	10-20
	n/a							3	Good	C	

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (mm)	Crown Spread (m) W N E S	Scaled Tree Diagram (m)	Notes	Recommendations		Physiological Condition	Life Expectancy (yrs)
								Priority	Inspect Freq (yrs)	Structural Condition	Retention Category
T15	Semi-Mature <b>Elder</b>  Sambucus nigra	5	1	160	1.5 1.5 1.5		1: Small insignificant specimen.	No action required.		Good	10-20
								n/a	3	Fair	C
T16	Semi-Mature <b>Elder</b>  Sambucus nigra	4	2	120	0 1.5 3		1: Small insignificant specimen.	No action required.		Fair	10-20
								n/a	3	Fair	C
T17	Semi-Mature <b>Elder</b>  Sambucus nigra	4	1.5	170	1.5 3 0.5		1: Small insignificant specimen.	No action required.		Fair	10-20
								n/a	3	Fair	C
T18	Semi-Mature <b>Sycamore</b>  Acer pseudoplatanus	9	2	290	3.4 3.4 3.4		1: Graffiti on main stem. 2: Inclusion of neighbouring tree. 3: Acceptable condition at present.	No action required.		Fair	40+
								n/a	3	Fair	C
T19	Mature <b>Portugese Laurel</b>  Prunus lusitanica	5.5	0.1	320	3.5 3 2.5		1: No significant defects observed.	No action required.		Good	10-20
								n/a	3	Fair	C
T20	Early-Mature <b>London Plane</b>  Platanus x hispanica	11	4	680	5.5 5.5 5.5		1: Good specimen. 2: Highway tree.	No action required.		Good	40+
								n/a	3	Good	B

## Appendix 2 – Tree Schedule Definition of Terms

Tree Referencing	<b>Individual Trees</b> T (+number) <b>Grouped Trees</b> G (+number) <b>Hedgerows</b> H (+number) <b>Woodlands</b> W(+number)
Age Category	<b>Young</b> Usually <15 years <b>Semi-mature</b> Significant growth expected, approximately one third of life expectancy complete <b>Early-Mature</b> Full height achieved with further significant growth possible, up to two thirds of life expectancy complete <b>Mature</b> Full height has been achieved with possible spreading of the canopy, usually past two thirds of overall life expectancy <b>Veteran</b> Usually a tree of significant age with characteristics that give additional cultural, landscape and conservation benefits, <b>Over-mature</b> A tree declining due to age as indicated by deterioration in the health and condition of its crown and trunk.
Species	<b>Botanical Name</b> - conforming to the International Code of Nomenclature for algae, fungi, and plants (ICN). For universal plant recognition. <b>Common Name</b> – commonly used names usually on a local and national scale.
Tree Height	The vertical distance between the base of the tree (where soil and buttress meet) and the tip of the highest branch on the tree.
Crown Height	Measured from ground level to the height at which the main crown begins.
Stem Diameter (DBH)	Stem diameter is measured at 1.5 m above ground level
Tree Diagrams	A diagrammatical representation of the tree taken from measurements of stem diameter, crown height and spread, and overall height.
Crown Spread: Crown	Measurements taken from all four cardinal points in metres.
Notes	Notes are made to inform of any possible defects, peculiarities or points of interest that may relate to the trees position, physiology, safety and possible effects on developments.
Recommendations	Recommendations are made in accordance to good arboricultural practice. Recommendations are made regardless to the end usage of the site.
Priority Scale	Priority is given dependant on the perceived threat and the likelihood of failure given to a possible hazard. The priority of work is given regardless of the end usage of the site. <b>Urgent</b> To be carried out as soon as possible. <b>Very High</b> To be carried out within 1 month. <b>High</b> To be carried out within 3 months. <b>Moderate</b> To be carried out within 1 year. <b>Low</b> To be carried out within 3 years.
Physiological Condition:	<b>Good</b> Usually healthy with no symptoms of poor health or disease. <b>Fair</b> Exhibiting signs of poor health or minor disease infections that are not considered to be hazardous. <b>Poor</b> Disease present in considerable quantities or with very poor physiological vigour. <b>Very Poor</b> Tree is in a moribund state in extremely poor condition, usually with little chance of recovery.
Structural Condition:	<b>Good</b> A tree with no significant structural defects. <b>Fair</b> Minor defects may have been observed but are not considered to be immediately hazardous. <b>Poor</b> Significant defects found. Tree requires monitoring or remedial works. <b>Very Poor</b> Major defects that require immediate remedial work or the removal of the tree.
Life Expectancy:	The estimated number of years before the tree may require removal should no unexpected mechanical or environmental impacts occur to the tree.
Retention Category:	Please refer to Tree retention categorisation table on the next page.

**Tree Retention Category** – The following table provides an explanation of retention categories used.

Trees to be removed		Colour on Plan
Category U includes trees of very low quality that offer little or no amenity value.	Trees that are in such a condition that they should be removed as a matter of good arboricultural practice regardless of given proposals.	RED
Trees to be considered for retention		Colour on Plan
Category A Trees of a high quality, with an estimated life of expectancy of at least 40 years	Trees that are excellent examples of their species, usually mature, with a safe useful life expectancy of at least 40 years. Category A trees are likely to enhance a development and should be retained wherever possible.	GREEN
Category B includes trees of moderate quality and amenity value.	Trees that are good examples of their species but may have defects or form that downgrade them from category A. Category B trees are usually mature or younger trees with the potential to reach A category in the future. Although the retention of these trees is desirable, some losses may be acceptable.	BLUE
Category C includes trees of low quality and amenity value.	Trees that are either young with a stem diameter less than 150mm or are unlikely to make a contribution for more than 10 years. The removal of these trees should be seen as acceptable in order to allow development to proceed. It may be possible to transplant younger specimens.	GREY
NOTE: Trees that are viewed as borderline and do not fit neatly into either of the categories are given a plus or minus rating (+/-) in the tree data schedule. Therefore C+ would denote a tree being borderline C/B although C is deemed to be the most appropriate category. Similarly B- would denote a tree being borderline B/C with B seen as the most appropriate category.		

## Appendix 3 – AIA Summary Table

The table below summarises the impacts found within the arboricultural impact assessment.

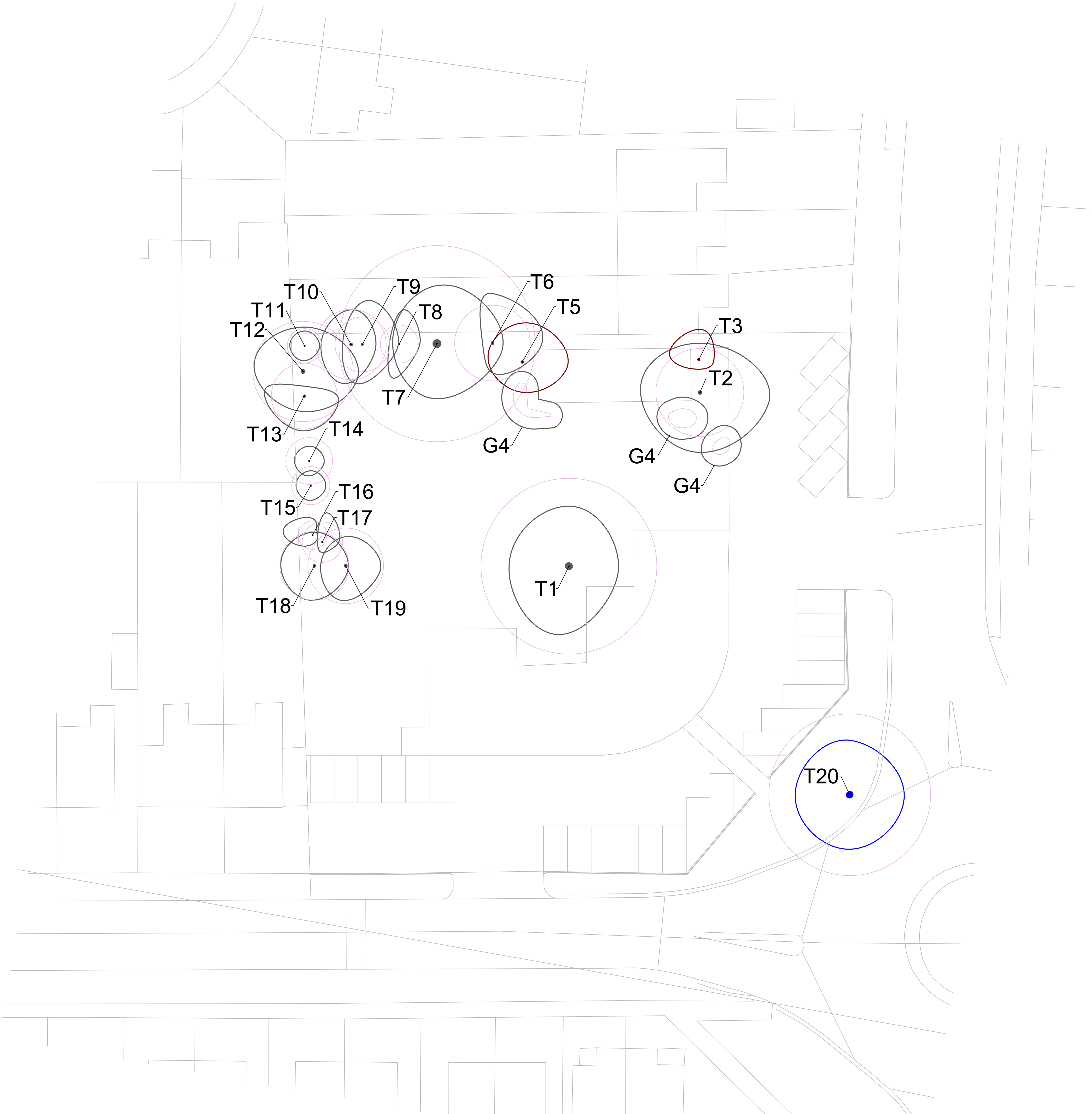
Impact identified	Reason for impact	Trees affected			
		Category A	Category B	Category C	Notes
Tree loss	Landscape improvements	-	-	T3,T5	Replace as part of landscape proposals and Local Authority requirements
Tree loss	Facilitate development	-	-	T1,T2,G4, T7,T14,T15	Replace as part of landscape proposals and Local Authority requirements
Potential root damage	Changes in ground surfaces	-	-	T6,T8,T10,T12, T13,T16,T17	See Section 3.6

## Appendix 4 – Site Plans

The site plans referred to in the report follow this page which include the following:

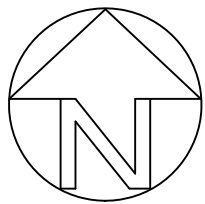
- Tree Constraints Plan
- AIA Plan
- Tree Removal Plan
- Tree Protection Plan

Although included plans are usually to scale, they are only intended to indicate positions of surveyed trees and dimensions should not be taken from these drawings.



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Notes:-



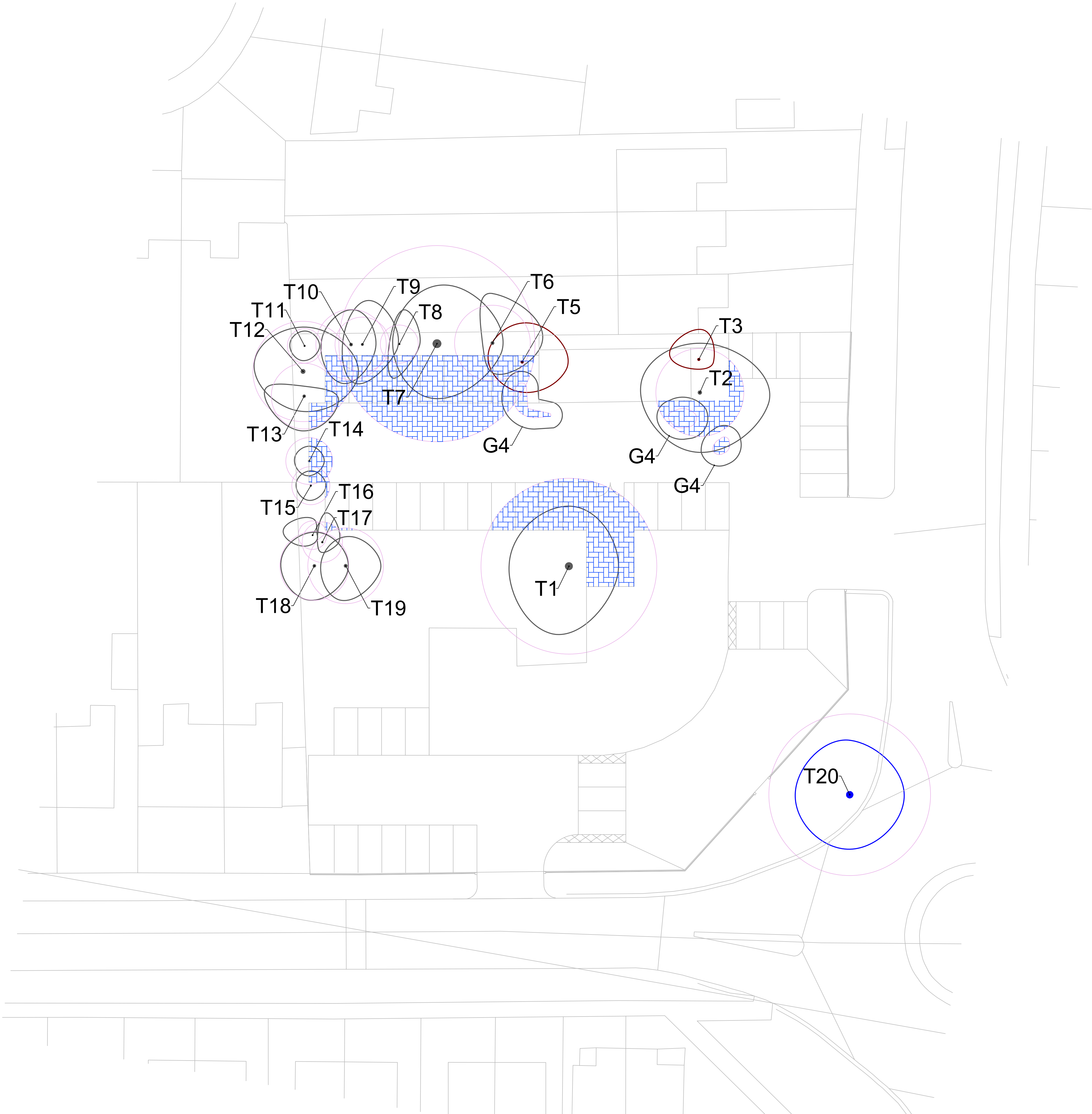
	Category A tree, group or hedge
	Category B tree, group or hedge
	Category C tree, group or hedge
	Category U tree, group or hedge
	Root Protection Area (RPA)

P01	20/08/15	Planning	DL	JC
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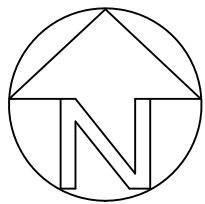
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Client: JS Design Partnership			
Project: The English Rose			
Title: Tree Constraints Plan			
Status: Planning			
Project:	11019	Drawn:	DL
		Checked:	JF
Scale @ A1:	1:200	Date:	20/08/15
		Approved:	JC
Drawing No: 11019.T01		Revision: P01	

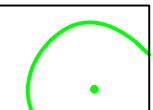
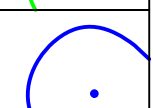
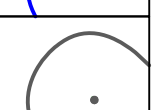


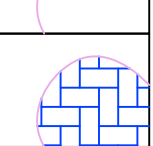




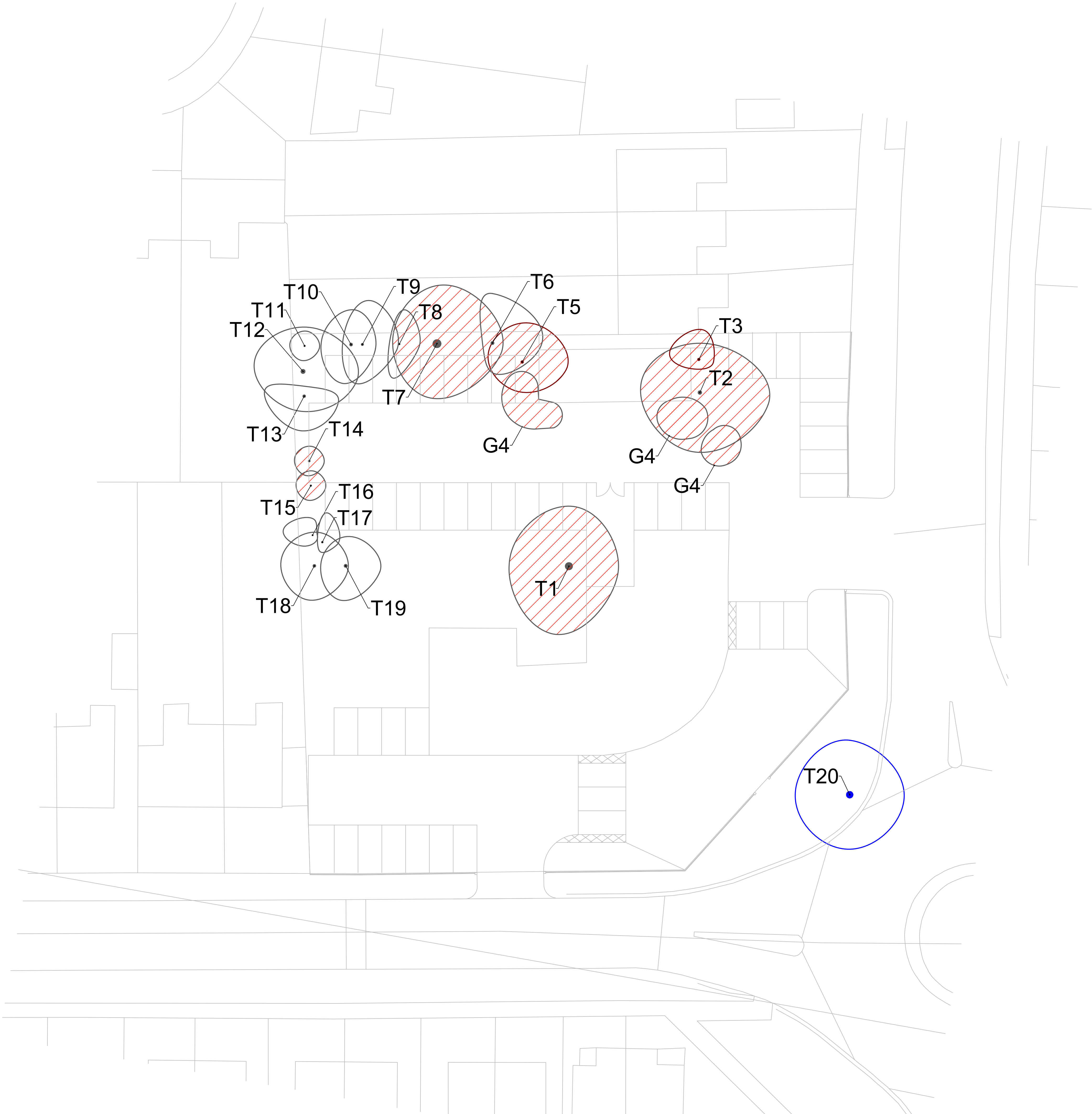
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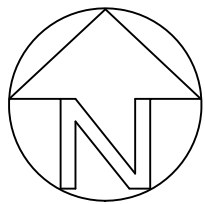
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-  Category B tree, group or hedge
-  Category C tree, group or hedge
-  Category U tree, group or hedge
-  Root Protection Area (RPA)
-  RPA affected by surface changes

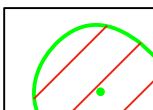
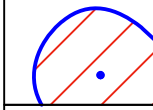
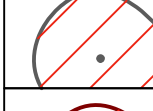
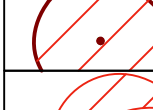

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JS Design Partnership					
Project:					
The English Rose					
Title:					
Arboricultural Impact Assessment					
Status:					
Planning					
Project:	11019	Drawn:	DL	Checked:	JF
Scale @ A1:	1:200	Date:	20/08/15	Approved:	JC
Drawing No:			Revision:		
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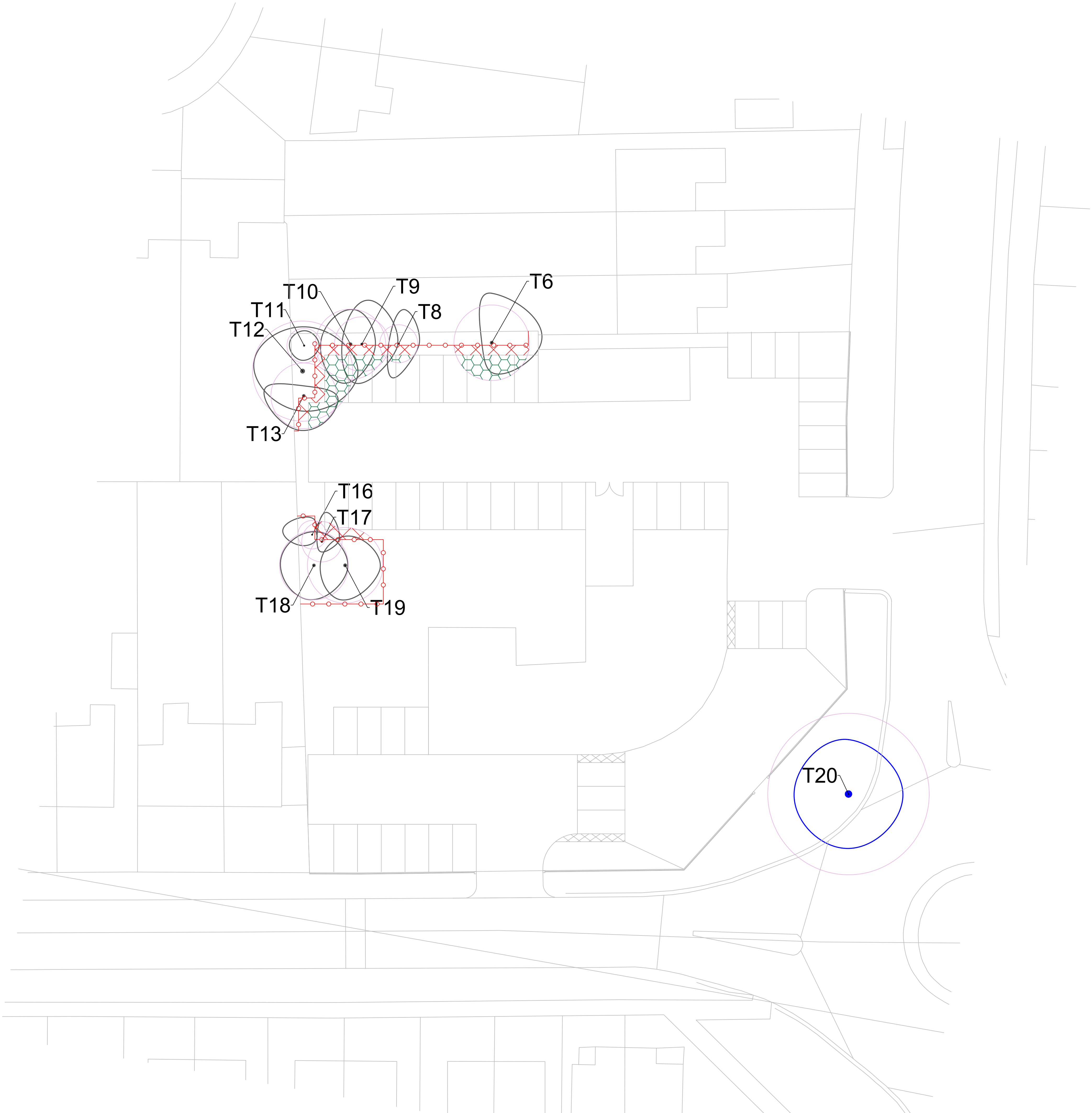


-  Category A tree, group or hedge
-  Category B tree, group or hedge
-  Category C tree, group or hedge
-  Category U tree, group or hedge
-  Extents of pruning

P01	20/08/15	Planning	DL	JC
REV.	DATE.	DESCRIPTION	DRAWN	CHK'D

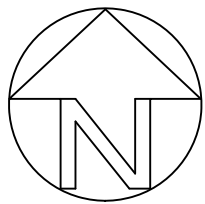


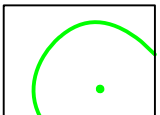
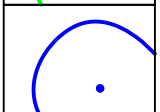
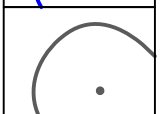

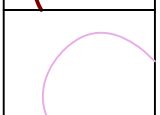
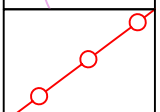
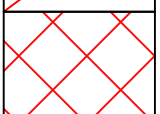
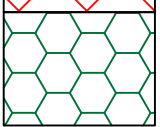
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Client: JS Design Partnership			
Project: The English Rose			
Title: Tree Removal Plan			
Status: Planning			
Project:	11019	Drawn:	DL
Scale @ A1:	1:200	Date:	20/08/15
Drawing No: 11019.T03		Checked:	JF
		Approved:	JC
		Revision:	P01



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Notes:-



-  Category A tree, group or hedge
-  Category B tree, group or hedge
-  Category C tree, group or hedge
-  Category U tree, group or hedge
-  Root Protection Area (RPA)
-  Protective fencing
-  RPA not protected by fencing (special care required)
-  Cellular Confinement System

P0120/08/15PlanningDLJC

REV.	DATE.	DESCRIPTION	DRAWN	CHK'D
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Client:

JS Design Partnership

Project:

The English Rose

Title:

Tree Protection Plan

Status:

Planning

Project:	11019	Drawn:	DL	Checked:	JF
Scale @ A1:	1:200	Date:	20/08/15	Approved:	JC
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11019.T04			P01		