



Arboricultural Impact Assessment
At
Chester Road Hostel, Chester Road, Highgate
On behalf of
London Borough of Camden



8th May 2020
Our Reference DFC 4363 Rev A
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Executive summary

An arboricultural survey has been carried out and this report prepared to accompany a planning application for residential development at Chester Road Hostel, Chester Road, Highgate. All trees that could be affected by the proposal or have an influence on it were inspected.

This report seeks to provide information in accordance with British Standard *BS 5837:2012, Trees in relation to design, demolition and construction*.

This report's purpose is to allow the Local Planning Authority to assess tree information as part of the planning submission.

The proposal has been designed to incorporate the most visually important trees on site. Ten trees and one small group will need to be removed to facilitate the development. The tree losses are predominantly from within the centre of the site, and any losses will be mitigated by the generous landscaping scheme which accompanies the application.

This report includes a generic arboricultural method statement to cover the principles of tree protection and works close to trees.

A detailed arboricultural method statement will be required following planning consent to include additional information on proposed paths/structures within root protection areas, and service/drainage routes as they become available.

If the recommendations made within this report are followed, the development will be achievable in arboricultural terms.

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1.0 Introduction

1.1 Instruction

DF Clark Bionomique Ltd were instructed by Bell Phillips Architects to produce an Arboricultural Impact Assessment in relation to the proposed residential development at Chester Road Hostel, Chester Road, Highgate.

It has been produced in accordance with the principles of British Standard *BS 5837:2012, Trees in relation to design, demolition and construction - Recommendations* (BS 5837) and includes the following information to accompany a planning application:

- details of significant trees including an assessment of condition using BS 5837 categorisation;
- a plan showing tree survey information, retention categorisation and root protection areas (RPA)¹;
- an assessment of the impact of the proposal on trees and any wider impact that has on local amenity and any impact trees may have on the proposed development;
- a tree protection plan showing the location of tree protection barriers and/or ground protection and any areas requiring specialist methods of work;
- identifying where an arboricultural method statement may be required; and
- a schedule of tree works to facilitate construction.

¹ *Root Protection Area (RPA) - A layout design tool indicating the minimum area surrounding the tree that contains sufficient rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. Clause 4.6.2 of BS 5837 states that the RPA may be changed in shape, taking into account local site factors, species tolerance, condition and root morphology.*

1.2 **The proposal**

To demolish the existing building and construct three new apartment blocks, incorporating a central courtyard and wider landscape scheme.

1.3 **Scope and purpose of this report**

This report's purpose is to allow the local planning authority (LPA) to assess the tree information as part of a full planning submission.

It covers trees on the site and those adjacent to the site which could be affected by any development. It is concerned with the impact the development may have on trees and the effect retained trees may have on the development.

An assessment of the impact of any works close to trees to be retained has been made and methods of work within RPAs are given where enough detail is known. Areas requiring specific, detailed arboricultural method statements (AMS) have been identified. A stand-alone AMS along with a revised tree protection plan may need to be produced at the technical design stage following planning consent.

The report covers arboricultural issues however; non-arboricultural matters may be referred to such as soils, ecology, construction methods etc. This should be viewed as provisional and the appropriate expert should be consulted where required.

Trees are long-lived organisms which take a long time to mature and if considered at an early stage can complement and increase the value of a development.

The layout has been designed to retain the more visually important trees within the site, and thereby minimise the impact to the local treescape and surrounding amenity.

1.4 **Legal constraints**

A check with London Borough of Camden on 5th June 2019, confirmed there are no tree preservation orders (TPOs) registered on the site but it does lie within the Dartmouth Park Conservation Area. Full details can be found in [Appendix 1](#).

1.5 **Tree work recommendations**

The tree surgery schedule found in Appendix 6 and trees shown for removal on the tree constraints plan in Appendix 4 are based on the proposed layout.

1.6 **Other information included in this report**

The following information is included in Appendix 1:

- documents and information provided;
- legal constraints and liabilities;
- survey methodology;
- reference documents.

2.0 Site visit and observations

2.1 Site visit

A site visit and tree survey were undertaken on 23rd May 2019 by Philippa Roberts. The data recorded that day forms the basis of this report.

2.2 Site description

The site is a triangular shaped piece of land located at the junction of Chester Road and Dartmouth Park Hill. It contains a single 'L' shaped building, with a small parking area to the north, and landscaped areas to the north and south-west. Dartmouth Park Hill runs along the eastern boundary from north to west, with Chester Road along the western boundary running north-west to south-east. There is a public right of way located to the north of the site. Within the landscaped area to the north, and to the front of the existing building there are a number of level changes with a slope from east to west.

2.3 The subject trees

There are twenty-five individual trees and three groups of trees which form the subject of this report. The trees have been categorised in the table below. Details of the trees as found at the time of the survey are in the tree survey sheets at [Appendix 3](#) and their locations are found on the plan at [Appendix 4](#). Since the survey was carried out T27 has died and has been removed. A replacement tree will form part of the development landscaping scheme.

| No. trees | BS: 5837 Category | Category Description |
|--------------------|----------------------|---|
| 0 trees | A | Life expectancy of at least 40 years, excellent example of species with high amenity value, should be retained. |
| 11 trees | B | Life expectancy of at least 20 years, reasonable example of species but with minor flaws, moderate amenity value and efforts should be made to retain tree. |
| 16 trees/groups | C | Life expectancy of at least 10 years, unremarkable specimen with limited merit or impaired condition, low amenity value, should not pose constraints. |
| 1 tree | U | Life expectancy less than 10 years due to significant defects, low vigour or poor placement |

3.0 Arboricultural impact assessment

3.1 Trees to be removed

The proposal requires the removal of ten trees and one small group, which equates to the loss of 3 category B trees and 8 category C features. The majority of which are small trees or located internal to the site, and so their loss will have a relatively low impact upon the amenity to the surrounding area.

A new landscaping proposal includes substantial new planting, with the formation of a new court yard and additional planting all around the site, which will more than mitigate for any tree losses and help to ameliorate the new development.

3.2 Root protection area incursions

There are two small sections where building footprints encroach within the RPA of trees to be retained. This is the single storey section of Block A and the north-east corner of Block B. Specialist construction and working methodology will be required in these areas, so that the adjacent trees can be suitably retained and protected.

There are a number of existing and proposed hard landscaping features, i.e. walls and paths etc., located within RPAs of trees to be retained. Root sensitive methods of demolition and construction will need to be incorporated to avoid detrimental impact to the root system of the adjacent trees.

3.3 Facilitation Pruning

Some access facilitation pruning will be required to provide sufficient clearance from the proposed buildings, however a number of trees have been previously pruned to provide clearance from the existing building or as part of a heavy maintenance regime. All pruning and tree removal data can be found in Appendix 6.

3.4 Protection of retained trees

Tree protective barrier locations, and temporary ground protection, with dimensions are included on the tree protection plan DFC4363 TPP.

3.5 Tree survey plan (TSP)

The plan found at [Appendix 4](#) is based on provided information and all scaled measurements and site boundaries must be checked against the original documents. This plan should only be used for dealing with the tree issues. It shows

the existing trees numbered and categorised in accordance with BS 5837. Below ground constraints are represented by the RPA. This is shown as a blue circle denoting the theoretical area containing enough rooting volume to maintain the tree's viability. Tree roots often do not grow in an even, symmetrical pattern, particularly in urban areas where underground obstructions, compacted soil and other conditions unsuitable for good root growth, influence the position of roots. The RPA is shown as a circle unless there is a reasonable certainty of the location of roots. It is most likely, however, that if available, roots will be proliferating within soft areas such as grass, shrub beds etc., rather than beneath hard surfaces and structures. The above ground constraints the trees represent are shown by their crown spreads. The survey plan is an aid to design and should not be used post consent on site; the tree protection plan is to be used for this purpose.

3.6 Tree constraints plan (TCP)

This plan is based upon the tree information from the TSP overlaid onto the proposed ground floor site plan drawing, to illustrate the impact of the proposed layout upon the existing trees. This drawing also shows the extent of the proposed basement element, as well as the constraints posed by the existing building footprint. Trees which cannot be retained due to direct conflict with the proposed layout are shown in red, and are proposed for removal.

3.7 Tree protection plan (TPP)

The plan found at [Appendix 5](#) is based on provided information and all scaled measurements and site boundaries must be checked against the original documents. This plan should only be used for dealing with the tree issues. This plan shows the location and details of tree protection measures throughout the site.

3.8 Photos



Photo 1 – showing the heavy pruning regime used on a number of trees throughout the site, in this instance on T14, looking west



Photo 2 – showing roots from T14 'escaping' the tree pit and extending under surrounding hard surfaces



Photos 3 -existing garden space, looking south, showing variable levels and surfaces. T6 in centre of photo



Photo 4 – looking east, showing T16 on left and T12 on right



Photos 5 – looking west, showing T3 in foreground with T2 directly behind and T1 in the background (red arrow)



Photo 6 – T20, looking north. This tree has not been heavily pruned, has good form and is considered to be the highest quality tree on site.

4.0 Arboricultural method statement

4.1 Tree protection plan (TPP)

- 4.1.1 The plan found at Appendix 5 is based on provide information and all measurements and site boundaries must be checked against the submitted plans. This plan should only be used for dealing with tree issues. All trees shown on the plan are to be retained, trees to be removed are shown on the tree constraints plan at Appendix 4. Tree protection is shown as barriers and ground protection defining the tree protection zone(TPZ)², and any areas requiring specialist methods of construction are also shown.

4.2 Site clearance, demolition and pre-construction works

- 4.2.1 Site clearance, demolition and pre-construction works such as soil investigations, are often undertaken before trees for retention are protected and this can result in irreparable damage being caused to the trees or their soil environment. It is important therefore that trees are protected before any works are carried out. The only exception to this is tree felling and tree surgery works which may be necessary before barriers are erected. Clearance of other site vegetation to enable access to erect the protective barriers should be factored in at this stage if necessary and this must be carried out with the use of hand tools only (including chainsaws, brushcutters etc.) but without the use of tracked or wheeled plant and machinery.

4.3 Tree protection barriers

- 4.3.1 Appendix 7 includes guidance for protective barriers based on BS 5837. The approximate location of the barriers and the TPZs is shown on the TPP. The precise location of the barriers and other protective measures should be confirmed at the pre-commencement meeting before any demolition or construction activities, including site clearance, begin.

² *Tree Protection Zone. An area based on the RPA in m² identified by an arboriculturist, to be protected during development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree*

4.4 Ground protection

- 4.4.1 In areas where it is not possible to erect protective barriers, ground protection must be used to protect the TPZ of trees. Where it has been agreed during the design stage, and as shown on the TPP, that vehicular or pedestrian access for the construction operation may take place within the TPZ, the possible effects of construction activity should be addressed by a combination of barriers and ground protection. The position of the barrier may be within the TPZ at the edge of the agreed working zone but the soil structure beyond the barrier to the edge of the TPZ should be protected with ground protection. The precise location should be confirmed at the pre-commencement meeting before any demolition or construction activities, including site clearance, start. This is to protect soil structure and tree roots.

4.5 Tree removals and tree surgery works

- 4.5.1 Trees for removal are identified on the tree constraints plan by having red solid crown spreads.
- 4.5.2 Recommendations for tree works can be found in the tree surgery schedule in Appendix 6. All works shall be in accordance with British Standard *BS 3998:2010 'Tree work: Recommendations'*, or in accordance with current best practice. The use of a competent tree surgery contractor is necessary to comply with this. The main contractor and tree surgery contractor must ensure that any necessary consents have been received from the local authority and that no protected species are harmed whilst carrying out site clearance or tree surgery works. Within TPZs, stumps, shrubs and other vegetation must be removed by hand or using specialised stump grinding machinery to minimise root damage to retained trees. Where poisoning of stumps is specified, this must be carried out by trained and qualified operatives. Only chemicals approved for this purpose and used in accordance with the manufacturer's instructions will be used.

4.6 Site set-up

- 4.6.1 Space must be allowed outside of RPAs for site cabins, machinery and materials storage, fuel storage, cement mixing and washing points etc. No discharge of potential contaminants should occur within 10m of a retained tree stem or where there is risk of run-off into RPAs.

4.6.2 Temporary buildings can sometimes be used within RPAs if agreed with the LPA and if site conditions allow. They will need to be installed on appropriate ground protection with no excavation taking place. All temporary services must be installed above ground level.

4.7 Work within tree protection zones

4.7.1 Only work agreed with the local planning authority can be carried out within TPZs.

4.7.2 Soil and archaeological investigations, contaminated soil removal, Japanese knotweed control, and other works not strictly part of the development but often needing extensive excavation. This has the potential to damage trees if within RPAs. The project arboriculturist should review any proposals to see if there are any conflicts with trees to be retained, and if so, discussions to find a mutually acceptable solution should occur.

4.8 Installation of hard surfacing

4.8.1 For the most part the proposed development utilises existing hard surfaces, and creates more soft landscaped areas around the trees to be retained.

4.8.2 The removal of the existing hard surfaces should be removed using hand tools only, or by machine under arboricultural supervision. New surfaces should be of a porous finish and make use of existing sub-bases where possible, or use a no-dig systems, such as a cellular confinement system.

4.8.3 The principles of a no-dig system are:

- No excavation other than the removal of existing hard surfaces if required, or the removal of surface vegetation and no more than 50mm of leaf litter, vegetation debris etc.
- A method to spread and support the load of the hard surface and anticipated usage without causing compaction of the soil structure beneath.
- The use of a porous sub-base and finishing layer to allow water and air diffusion in and out of the soil.
- Porosity must be designed to be long-term and not to block with fine particles in the short-term; therefore irregular, no-fines aggregate must be used.

- The pH of the aggregate must be considered as many conventional road stones have very high pH values which can damage susceptible trees and therefore aggregates with a near neutral pH should be preferred.

4.9 Site hoarding and signs & fencing

- 4.9.1 Where posts are to be installed within RPAs the holes must be dug carefully by hand. If roots with a diameter of 25mm or greater are found, the position of the post must be moved. Roots smaller than 25mm diameter can be cut with sharp tools leaving as small a wound as possible. The sides of the hole should be lined with an impermeable membrane such as plastic sheeting to prevent the caustic and toxic effects of wet cement in the concrete from damaging tree roots.

4.10 Services

- 4.10.1 The location and direction of new services should be designed to allow for services to be routed away from the RPAs of retained trees.
- 4.10.2 If any services need to run through a RPA the main contractor must contact the arboricultural consultant before any works are undertaken. Agreement will then be sought from the LPA tree officer on methodology. Works will only begin with the agreement of the LPA. Methodology used must comply with NJUG Volume 4: Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees, which can be summarised as:
- Hand excavate only.
 - Do not cut roots over 25mm in diameter without referring to the project arboriculturist.
 - For roots less than 25mm in diameter use a sharp tool to make a clean cut leaving as small a wound as possible.

4.11 Landscaping

- 4.11.1 Landscape operations within root protection areas have the potential to damage trees if not carried out with care; in addition, the removal of protective barriers to carry out landscape operations may allow other contractors in previously protected areas.

4.11.2 If protective fencing is taken down to facilitate landscaping operations, the area of the TPZ must be delineated by pins and marker tape, spray paint, or some other method to clearly show the extent of the TPZ.

4.11.3 The preparation of soil for planting and turfing must be carried out by hand where within TPZs. Cultivation should be kept to a minimum and new topsoil added must not exceed 100mm in depth within 1m of the stem of any tree.

4.11.4 Topsoil and other materials must be transported by wheelbarrow on running boards when working within TPZs.

4.12 Other site works with the ability to affect trees

4.12.1 Site and fuel storage, cement mixing and washing points

4.12.1.1 All site storage areas, cement mixing and washing points for equipment and vehicles and fuel storage areas should be outside RPAs unless otherwise agreed with the LPA. No discharge of potential contaminants should occur within 10 m of a retained tree stem or where there is a risk.

4.12.2 Use of piling rigs, cranes and other tall plant and vehicles

4.12.2.1 Piling rigs and cranes are often used close to trees. Where tree protection barriers do not entirely protect the canopies of trees from potential damage from high vehicles and plant, care must be taken to ensure no damage is caused. Work must be carefully planned and a banksman used to guide the operator. Arboricultural supervision may be required.

5.0 Site management and supervision

5.1 Pre-commencement site meeting

- 5.1.1 Before any site works including site clearance begin, a site meeting between the site manager and arboricultural consultant should be held and to which the LPA tree officer will be invited. The purpose of the meeting will be to discuss tree protection measures detailed in this document and to agree the sequence of events where they can impact on trees. At this meeting a programme of tree protection will be agreed by all parties to form the basis of any monitoring and/or supervision arrangements between the arboricultural consultant and the developer.
- 5.1.2 At the pre-commencement meeting, the contact details of the following should be agreed:
- The site manager or other person on site responsible for ensuring tree protection is in accordance with that agreed.
 - The LPA tree officer and/or case officer.
 - The project arboriculturist.
 - Any other relevant party.

5.2 Site management

- 5.2.1 It is the responsibility of the main contractor to ensure that the details of this report are known, understood and followed by all site personnel. As part of the site induction, all site personnel who could have an impact on trees should be briefed on specific tree protection requirements. Copies of the report and plans should be available on site at all times.

5.3 Site monitoring and supervision

- 5.3.1 Once work begins on site, the project arboricultural consultant should visit site at an interval agreed at the pre-commencement site meeting. The interval should be sufficiently flexible to allow the supervision of key works as they occur. These are likely to include the following although the list is not exclusive:
- tree pruning and felling and site clearance close to trees;
 - installation of tree protection barriers;
 - installation of ground protection;

- 5.3.2 The arboricultural consultant's role is to monitor compliance with arboricultural conditions and advising on any tree problems that arise or modifications that become necessary. Following every site visit, a short report will be sent to the local authority tree officer and the client/developer. Tree site supervision reports are useful not only as an audit trail for the client and local planning authority, showing compliance to tree protection conditions, but also to provide evidence of retention and protection of 'ecological features of value' which is required under Code for Sustainable Homes section Eco 3.
- 5.3.3 Should any issues or compromises occur during the development which have an impact on any retained tree it is the responsibility of the site manager to inform the project arboriculturist who will notify the LPA tree officer of the issue and any proposed remedial works.
- 5.3.4 A schedule of arboricultural monitoring and supervision should be completed at the pre-commencement site meeting listing key stages requiring monitoring and/or supervision

6.0 Conclusions

- 6.1 Ten trees and one small group will need to be removed to facilitate the development. The tree losses are predominantly from within the centre of the site, and any losses will be mitigated by the accompanying landscaping scheme.
- 6.2 There are two small sections where building footprints encroach within the RPA of trees to be retained. Specialist construction and working methodology will be required in these areas, so that the adjacent trees can be suitably retained and protected.
- 6.3 There are a number of existing and proposed hard landscape features, i.e. hard surfaces and low-rise structures, located within RPAs of trees to be retained. Root sensitive methodologies will need to be incorporated to minimise the impact to adjacent trees, when removing and installing these landscape features.
- 6.4 A small number of trees will require crown pruning to provide adequate clearance of the proposed buildings. Most have already been heavily pruned as part of a regular maintenance regime, but all proposed works are within acceptable levels, and should not adversely affect the health or future retention of the trees.
- 6.5 Tree surgery works, including tree removals, and installation of tree protection barriers will need to be completed and in place before any other site works commence.

7.0 Recommendations

- 7.1 A detailed arboricultural method statement is created post planning consent to include specific details on any works within RPAs, monitoring/supervision requirements and any drainage/service locations.
- 7.2 The routes of proposed services should be assessed by the project arboriculturist and a detailed arboricultural method statement produced in conjunction with the services engineer and contractor if services are to be routed within root protection areas.
- 7.3 Foundation design should take into account trees to be retained, trees to be removed and new trees to be planted. Specialised foundation design within RPAs should be discussed with the project arboriculturist to ensure that it meets the needs of adjacent trees. The details of which should be included within a detailed arboricultural method statement.

Appendix 1

Survey and background information

1. **Methodology**

The trees were surveyed from ground level without detailed investigations. All trees with a trunk diameter of 75mm or above were surveyed, as recommended in BS 5837. All dimensions were estimated unless otherwise indicated. Obvious hedges and shrub masses were identified where appropriate. Information collected is in accordance with recommendations in subsection 4.4.2.5 of BS 5837 and includes species, height, diameter, branch spread, crown clearance, age class, physiological condition, structural condition and remaining contribution. Each tree was then allocated one of four categories (U, A, B or C) to reflect its suitability as a material constraint on development.

2. **Documents and information received**

- Topographical survey, drawing – 17890/T/01-01, by EDI Surveys Ltd.
- Proposed Lower Ground Floor Site Plan, drawing – 0614-BPA-XX-DR-A-00100/C, by Bell Phillips Architects
- Proposed Ground Floor Site Plan, drawing - 0614-BPA-XX-DR-A-00101/C, by Bell Phillips Architects
- Landscape Masterplan, drawing -220-PL-001, by Anna French Associates Ltd

3. **Reference documents**

- *British Standards Institution (2012) BS 5837: Trees in relation to design, demolition and construction – Recommendations;*
- *National Joint Utilities Group (2007) Volume 4, Issue 2: Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees;*

4. **Legal constraints and liabilities**

Tree preservation orders: There are no tree preservation orders that affect the site.

The tree protection status is correct at the time of the check with the local authority but can be subject to change. It is therefore the responsibility of any persons undertaking tree works operations to the trees which are the subject of this report and in accordance with our recommendations, to undertake their own statutory tree protection checks with the local planning authority, to include TPO, conservation area (CA) and planning conditions prior to works commencing.

Conservation Areas: The site is within a conservation area.

Common Law: This enables pruning back of the crown and roots of trees on adjacent land where they overhang neighbouring property, providing the work is reasonable and does not cause harm. This right does not override TPO and CA legislation.

Ecological constraints: The Wildlife and Countryside Act 1981, as amended, The Conservation of Habitats and Species Regulations 2010 and the Countryside and Rights of Way Act 2000, provide statutory protection to species of flora and fauna including birds, bats and other species that are associated with trees. These could impose significant constraints on the use and timing of access to the site. It is the responsibility of the main contractor and tree surgery contractor to ensure that no protected species are harmed whilst carrying out site clearance or tree surgery works. Unless competent to do so, the advice of an ecologist must be sought.

Appendix 2

Key to tree survey sheets

Key to terms

T = Tree **G** = Group **H** = Hedge **S** = Shrub mass

Age Class:

NP = Newly planted.

Y = Young - an establishing tree that could be easily transplanted.

SM = Semi-mature - an established tree still to reach its ultimate height and spread and with considerable growth potential.

EM = Early mature - a tree reaching its ultimate height and whose growth is slowing however it will still increase considerably in stem diameter and crown spread.

M = Mature - a tree with limited potential for further significant increase in size although likely to have a considerable safe useful life expectancy.

OM = Over mature - a senescent or moribund tree with a limited useful life expectancy.

V = Veteran - a tree older than typical for the species and of great ecological, cultural or aesthetic value.

Dia: Diameter of stem in millimetres at 1.5m above ground level for single-stemmed trees or in accordance with Annex C of BS 5837 for multi-stemmed trees or trees with low forks or irregular stems.

Stems: Numbers of stems or M/S = multi-stemmed.

Ht: Height in metres.

Ult ht: Ultimate height likely to be achieved for this tree in this location. The suggested ultimate height of trees within this report is based on physiological and site conditions and may differ from industry tables. Its purpose is to inform shading, visual aspects and post-development pressures and not necessarily foundation design.

Cr ht : Height of canopy above ground level.

NSEW: Crown spread at the four cardinal points. .

BS cat: Category in accordance with Table 1 and section 4.5 of BS 5837.

U - Unsuitable for retention. Existing condition is such that they cannot be realistically retained as living trees in the context of the current land use for longer than 10 years. Please note category U trees can have existing or potential conservation value, which it might be desirable to preserve.

A - High quality and value (non-fiscal) with at least 40 years remaining life expectancy.

B - Moderate quality and value with at least 20 years remaining life expectancy.

C - Low quality and value with at least 10 years remaining life expectancy, or young trees with a stem diameter below 150 mm.

A, B and C category trees are additionally graded into: 1) Mainly arboricultural values; 2) Mainly landscape values; 3) Mainly cultural values including conservation.

Cond: Physiological condition. G = good; F = fair; P = poor; D = dead.

Life exp: Estimated remaining contribution in years.

RPR: Root protection radius in metres based on stem diameter.

RPA: Root protection area. A layout design tool indicating the minimum area surrounding the tree that contains sufficient rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. Assessed according to the recommendations set out in clause 4.6 of BS 5837. It is calculated by multiplying the radius squared by 3.142. Clause 4.6.2 of BS 5837 states that the RPA may be changed in shape, taking into account local site factors, species tolerance, condition and root morphology.

Recommendations: Preliminary recommendations for tree surgery found within the tree survey sheets are based on findings at the time of the tree survey and are not based on any development proposal and are usually works for safety or sound arboricultural reasons and are irrespective of any change in land use.

Appendix 3

Tree survey sheets

| Tree Number | Botanical Name (Common name) | Age | Dia (mm) | Stems | Height (crown height) | N | E | S | W | Cond | Life Exp | BS Cat | RPR (m) | RPA (m ²) | Comments | Recommendations |
|-------------|---------------------------------------|-----|-------------|-------|--------------------------|-----|---|---|-----|------|-------------|-----------|---------|-----------------------|---|-----------------|
| T1 | Tilia X europaea (Common Lime) | EM | 530 | 1 | 9(3) | 3 | 3 | 3 | 3 | Fair | 20+ | B2 | 6.36 | 127.09 | Located within planting pit within the site boundary, surrounded by dry jointed paving. Some small open wounds on stem with dense basal and epicormic growth. Tree is maintained as a pollard. Reasonable condition but low category B. | |
| T2 | Robinia pseudoacacia (Locust Tree) | EM | 490 | 1 | 10(3) | 3.5 | 4 | 5 | 6 | Fair | 20+ | B2 | 5.88 | 108.63 | Growing on a small grassy bank, with a slight lean to the south. No major defects but recently topped to initiate a pollard regime. Significant epicormic/reactive growth to pruning with no regrowth at immediate branch ends. Condition of tree and tolerance of pruning regime will need to be monitored. Very low category B due to recent pruning. | |
| T3 | Robinia pseudoacacia (Locust Tree) | EM | 380 | 1 | 10(3) | 3 | 6 | 5 | 4.5 | Fair | 20+ | B2 | 4.56 | 65.33 | Growing on small grassy bank, with slight lean to south-east. Previously topped and pollarding regime a little more established than on neighbouring tree, with more terminal growth. Very low category B. | |
| T4 | Tilia cordata (Small-leaved Lime) | EM | 520 | 1 | 11(3) | 4 | 4 | 4 | 4 | Fair | 20+ | B2 | 6.24 | 122.34 | Growing on a raised area of ground with retaining wall to the south. Heavily pollarded in the past but now maintained as a higher pollard. No major defects but crown making contact with adjacent building. Reasonably attractive when in leaf. | |

| Tree Number | Botanical Name (Common name) | Age | Dia (mm) | Stems | Height (crown height) | N | E | S | W | Cond | Life Exp | BS Cat | RPR (m) | RPA (m ²) | Comments | Recommendations |
|-------------|--|-----|-------------|-------|--------------------------|-----|---|---|-----|------|-------------|-----------|---------|-----------------------|---|-----------------|
| G5 | Cotoneaster frigidus (Cotoneaster), Lilac (Syringa vulgaris) | EM | 173 | 3 | 5(2) | 3 | 3 | 3 | 3 | Fair | 20+ | C2 | 2.08 | 13.59 | Group containing one lilac and one cotoneaster. Cotoneaster is quite broad spreading, located at the base of the steps and the dominant of the two trees. Both trees are unremarkable. | |
| T6 | Malus (Apple) | EM | 247 | 2 | 5(2) | 3.5 | 3 | 4 | 3 | Fair | 20+ | C2 | 2.96 | 27.53 | Located at the base of a sloping bank. Some old pruning wounds, otherwise no major defects and in reasonable condition. | |
| T7 | Sorbus aucuparia (Rowan) | SM | 140 | 1 | 7(3) | 2.5 | 1 | 2 | 2 | Poor | 10+ | C2 | 1.68 | 8.87 | Numerous wounds and cavities with most branches on east pruned away from building. Dieback and deadwood, tree is not thriving. | |
| T8 | Robinia pseudoacacia (Locust Tree) | EM | 380 | 1 | 10(3) | 4.5 | 6 | 4 | 4 | Fair | 20+ | B2 | 4.56 | 65.33 | Historic lean to east with slight crown bias as well. No major defects and reasonable condition. Light basal and epicormic growth. Not the best example of its species but an attractive tree within its setting. | |
| T9 | Cotoneaster frigidus (Cotoneaster) | EM | 200 | 4 | 5(2) | 3 | 3 | 3 | 2.5 | Fair | 10+ | C2 | 2.4 | 18.1 | Limited rooting and growing environment, growing on a narrow bank beside steps. Some tight unions and crossing rubbing branches. Likely limited retention time. | |

| Tree Number | Botanical Name (Common name) | Age | Dia (mm) | Stems | Height (crown height) | N | E | S | W | Cond | Life Exp | BS Cat | RPR (m) | RPA (m ²) | Comments | Recommendations |
|-------------|------------------------------------|-----|-------------|-------|--------------------------|-----|---|---|-----|------|-------------|-----------|---------|-----------------------|--|-----------------|
| T10 | Prunus avium (Wild Cherry) | M | 560 | 1 | 15(3.5) | 4 | 6 | 6 | 4 | Fair | 20+ | B2 | 6.72 | 141.89 | Large cherry tree with tight main union but not considered to be of significant concern at this stage of the tree's life. Wooden brace erected around the tree, but unclear for what purpose. Large surface roots to west with mower damage and associated decay. Reasonable form and condition. | |
| T11 | Fraxinus excelsior (Ash) | EM | 460 | 1 | 16(6) | 3.5 | 4 | 4 | 3.5 | Fair | 20+ | B2 | 5.52 | 95.74 | Stem bifurcates at approximately 3m, with reasonable union. Tree has been crown reduced. Tree is a little lost in the crowns of the adjacent trees. | |
| T12 | Acer saccharinum (Silver Maple) | EM | 530 | 1 | 14(3.5) | 5 | 5 | 5 | 6 | Fair | 20+ | B2 | 6.36 | 127.09 | Tree has been topped to control height and spread towards building, resulting in crowded regrowth and dead stubs. Unremarkable example of species but providing some amenity to site. Basal growth | |
| T13 | Malus (Apple) | SM | 153 | 2 | 6(2.5) | 1.5 | 2 | 3 | 3 | Fair | 10+ | C1 | 1.84 | 10.64 | Located within uneven grassed area, pruned away from street light and building. Unremarkable tree of average form and condition. | |
| T14 | Robinia pseudoacacia (Locust Tree) | EM | 420 | 1 | 9(3) | 3.5 | 4 | 4 | 4 | Fair | 20+ | B2 | 5.04 | 79.81 | Located within small tree pit with roots evidently escaping over the kerb line and under surrounding tarmac. Tree has been recently topped/pollarded, resulting in epicormic/reactive growth. Very low category B due to recent pruning. | |

| Tree Number | Botanical Name (Common name) | Age | Dia (mm) | Stems | Height (crown height) | N | E | S | W | Cond | Life Exp | BS Cat | RPR (m) | RPA (m ²) | Comments | Recommendations |
|-------------|-------------------------------------|-----|----------|-------|-----------------------|-----|---|---|-----|------|----------|--------|---------|-----------------------|---|-----------------|
| T15 | Prunus avium (Wild Cherry) | SM | 160 | 1 | 16(6) | 3 | 4 | 3 | 3 | Fair | 20+ | C1 | 1.92 | 11.58 | Located in raised planter. Large wounds and cankers on main stem, which are likely to limit life expectancy. | |
| T16 | Platanus X hispanica (London Plane) | SM | 630 | 1 | 17(5) | 9 | 9 | 5 | 8 | Fair | 20+ | B1 | 7.56 | 179.5 | Significant lean to the north due to competition with adjacent trees. Reasonable form and condition. Disrupting tarmac surface around base and to the west, with large diameter roots beneath | |
| T17 | Sorbus aucuparia (Rowan) | SM | 150 | 1 | 5(2) | 2 | 2 | 2 | 2 | Fair | 20+ | C1 | 1.8 | 10.18 | Located within raised bed. Some minor pruning wounds and bark damage on stem, otherwise reasonable form and condition. | |
| T18 | Prunus avium (Wild Cherry) | EM | 310 | 1 | 8(2.5) | 4 | 5 | 5 | 4.5 | Fair | 10+ | C1 | 3.72 | 43.48 | Growing in raised planter. Large canker at old branch wound around crown break, which will reduce its SULE (safe useful life expectancy). | |
| T19 | Sambucus nigra (Elder) | EM | 167 | 5 | 5(2) | 2.5 | 3 | 3 | 2.5 | Fair | 20+ | C1 | 2 | 12.57 | Growing in tree pit within paved area. No major defects but average form and condition. | |
| T20 | Fraxinus excelsior (Ash) | EM | 540 | 1 | 17(4) | 8.5 | 7 | 9 | 7 | Fair | 20+ | B1 | 6.48 | 131.93 | Tree has been reduced in past but allowed to lapse in recent years. Some fairly minor deadwood which should be removed due to significant target area. Otherwise an attractive tree with good form and condition. Located in tree pit within paved area at top of steps | Remove deadwood |

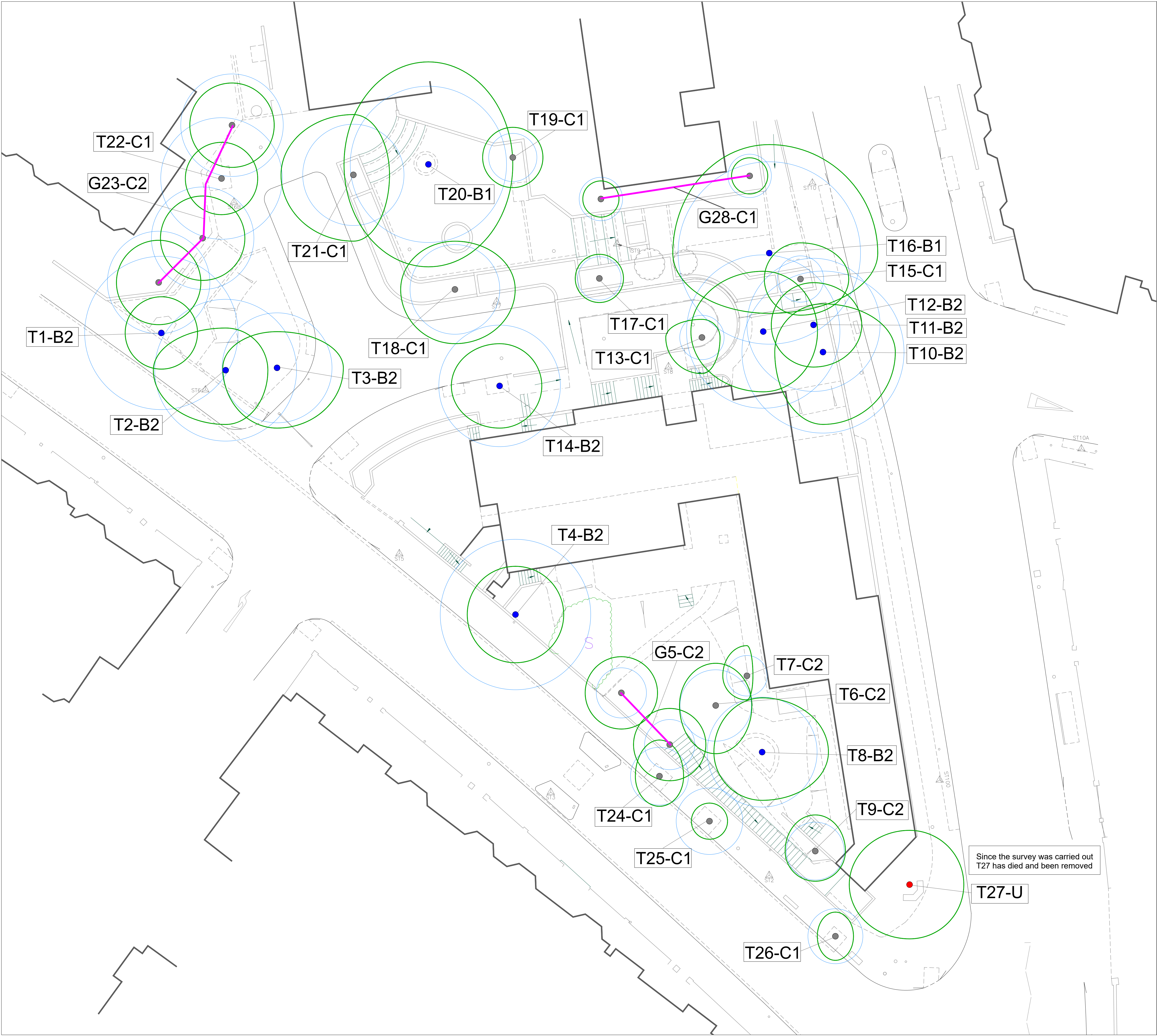
| Tree Number | Botanical Name (Common name) | Age | Dia (mm) | Stems | Height (crown height) | N | E | S | W | Cond | Life Exp | BS Cat | RPR (m) | RPA (m ²) | Comments | Recommendations |
|-------------|--|-----|-------------|-------|--------------------------|-----|---|---|-----|------|-------------|-----------|---------|-----------------------|--|-----------------|
| T21 | Prunus avium (Wild Cherry) | EM | 350 | 1 | 8(2.5) | 5 | 3 | 6 | 6 | Fair | 20+ | C1 | 4.2 | 55.42 | Growing in raised planter. Tree has been reduced in past with no ill effect. Reasonable form and condition. | |
| T22 | Aesculus hippocastanum (Horse Chestnut) | EM | 420 | 1 | 9(3) | 3 | 3 | 3 | 3 | Fair | 20+ | C1 | 5.04 | 79.81 | Growing in a tree pit within paved area. Tree has been heavily topped with resulting bushy epicormic growth. Some bleeding on stem and old occluding wound. | |
| G23 | Acer pseudoplatanus (Sycamore),X Cupressocyparis leylandii (Leyland Cypress) | EM | 354 | 2 | 9(3) | 3.5 | 4 | 4 | 3.5 | Fair | 20+ | C2 | 4.25 | 56.75 | Group of offsite trees growing close to the site boundary. Containing two cypress and one sycamore to the east. All trees are growing close to the dwelling and casting significant shade. Only viewed from within the site, so most measurements are estimated. Unremarkable trees of average form and condition. | |
| T24 | Sorbus intermedia (Swedish Whitebeam) | SM | 200 | 1 | 5.5(2.5) | 3 | 2 | 3 | 2 | Fair | 20+ | C1 | 2.4 | 18.1 | Offsite street tree growing in small tree pit. Old impact damage on south-west at base. Slightly suppressed by onsite cotoneaster. | |
| T25 | Crataegus monogyna (Hawthorn) | SM | 230 | 1 | 5.5(2.5) | 1.5 | 2 | 2 | 1.5 | Fair | 10+ | C1 | 2.76 | 23.93 | Offsite street tree growing in small tree pit. All lower branches have been removed leaving a rather lollipop shaped tree with limited amenity value. | |

| Tree Number | Botanical Name (Common name) | Age | Dia (mm) | Stems | Height (crown height) | N | E | S | W | Cond | Life Exp | BS Cat | RPR (m) | RPA (m ²) | Comments | Recommendations |
|-------------|--|-----|-------------|-------|--------------------------|-----|---|---|-----|------|-------------|-----------|---------|-----------------------|---|-----------------|
| T26 | Crataegus monogyna (Hawthorn) | SM | 190 | 1 | 4(2.5) | 2 | 2 | 2 | 1.5 | Fair | 10+ | C1 | 2.28 | 16.33 | Offsite street tree growing in small tree pit. A number of branches have been removed on the north leaving a rather unbalanced crown, but remaining a fairly attractive small tree. | |
| T27 | Aesculus hippocastanum (Horse Chestnut) | EM | 580 | 1 | 14(4) | 4.5 | 5 | 5 | 5 | Fair | <10 | U | 6.96 | 152.2 | Growing within small tree pit surrounded by tarmac and paving. Numerous areas of bleeding on stem. Tree has been reduced and pollarded in the past. Very sparse, undersized leaves, with significantly reduced vigour, tree is unlikely to survive the summer. NB: Tree subsequently died and was removed at the beginning of the 2020 growing season. | |
| G28 | Cotoneaster frigidus (Cotoneaster), Eucalyptus gunnii (Cider Gum) | SM | 150 | 1 | 4(2) | 1.5 | 2 | 2 | 1.5 | Fair | 10+ | C1 | 1.8 | 10.18 | Offsite eucalyptus and cotoneaster. Only viewed from within the site with view of both trees obscured by boundary features. Assumed to be in reasonable form and condition. | |

Appendix 4

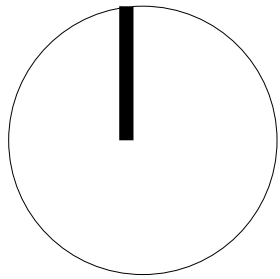
Tree survey plan DFC 4363 TSP &

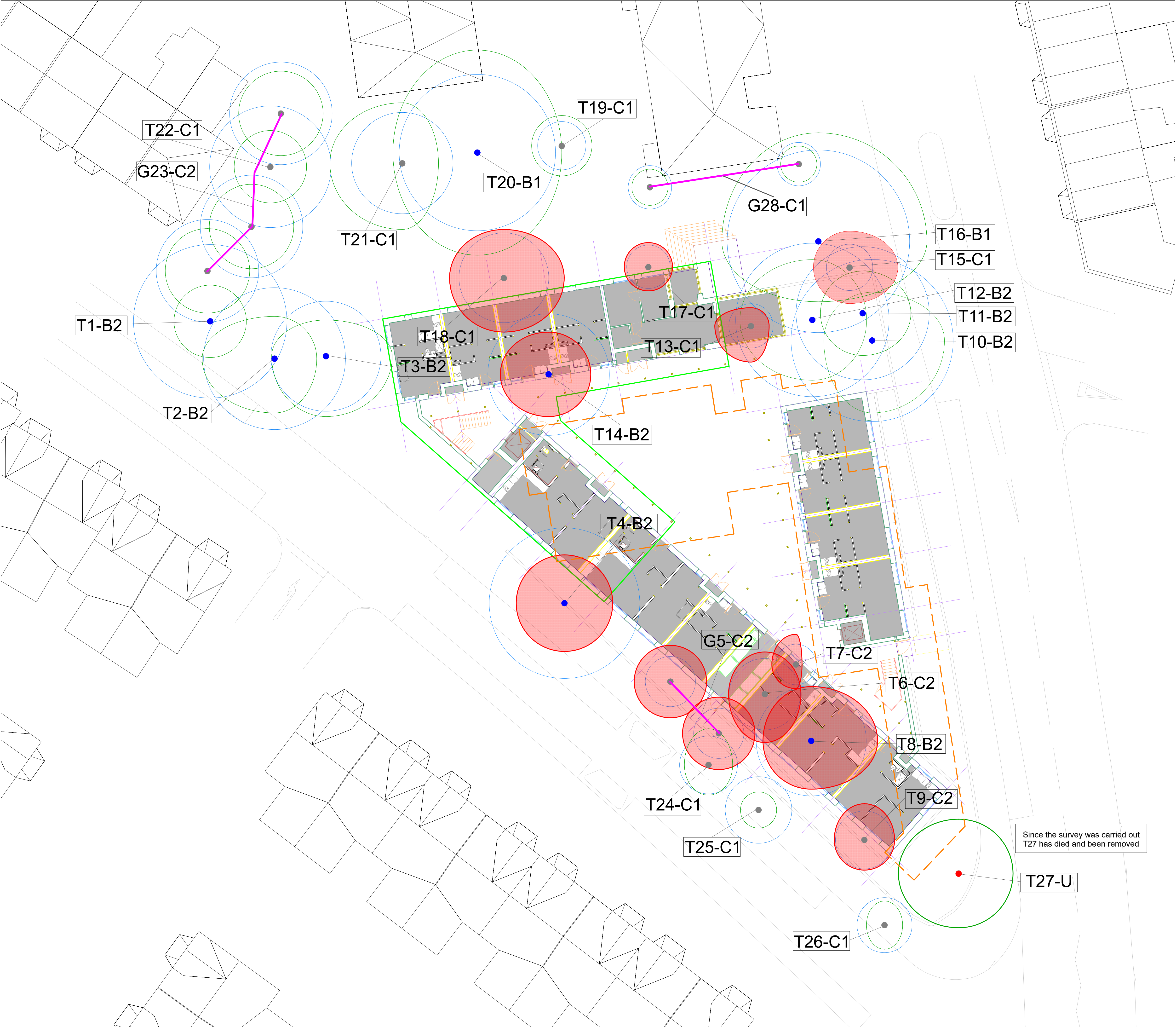
Tree constraints plan DFC 4363 TCP



- Category A – High quality and value
- Category B – Moderate quality and value
- Category C – Low quality and value
- Category U – Unsuitable for long-term retention
- RPA – root protection area as defined by Table 2 BS 5837: 2012
- Crown Spread
- Group of Trees

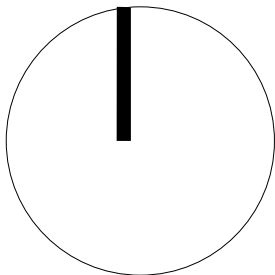
| | | | | |
|---|-------------|--------------------------|------|----------------|
| A | | Death and removal of T27 | PJR | 08.05.2020 |
| Revision | Description | Drawn | Date | |
| D F Clark Bionomique Ltd | | | | |
| Client | | | | Date |
| London Borough Of Camden | | | | 27.05.19 |
| Site address | | | | Scale |
| Chester Road Hostel, Chester Road, Highgate | | | | 1:150@ A1 |
| Drawing title | | | | Drawing number |
| Tree Survey Plan | | | | DFC4363_TSP |
| Orientation | | | | Revision |
| | | | | A |
| | | | | Drawn |
| | | | | PJR |
| | | | | Authorised |
| | | | | Drawing status |





- Category A – High quality and value
- Category B – Moderate quality and value
- Category C – Low quality and value
- Category U – Unsuitable for long-term retention
- RPA – root protection area as defined by Table 2 BS 5837: 2012
- Crown Spread of Tree to be Retained
- Tree to be Removed
- Outline of Proposed Basement
- Footprint of Existing Building

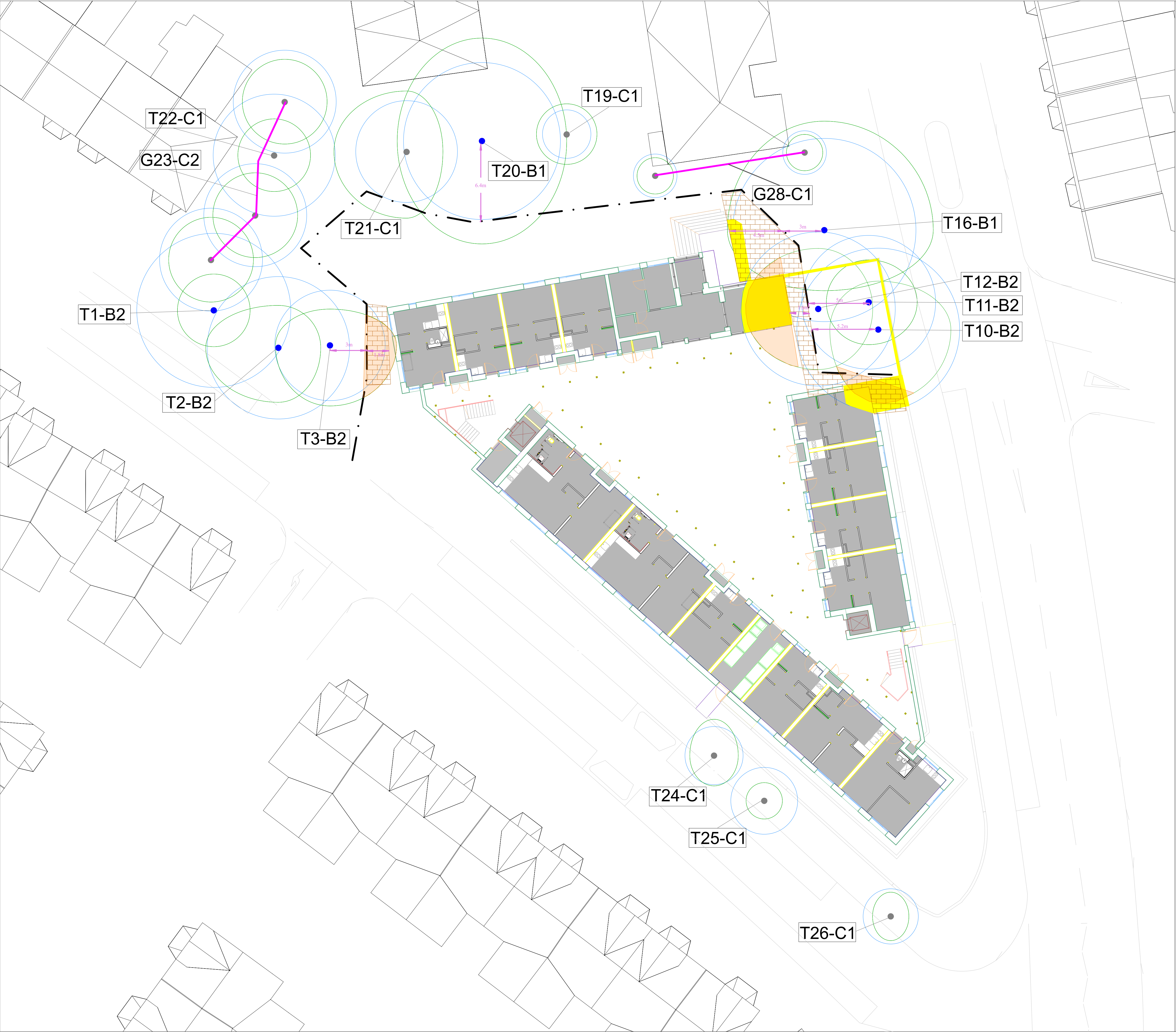
| | | | | |
|--|-------------|--------------------------|------|------------|
| A | | Death and removal of T27 | PJR | 08.05.2020 |
| Revision | Description | Drawn | Date | |
| <div><div>D F Clark</div><div>Bionomique Ltd</div></div> | | | | |
| Client | | Date | | |
| London Borough Of Camden | | 09.11.19 | | |
| Site address | | Scale | | |
| Chester Road Hostel, Chester Road, Highgate | | 1:150@ A1 | | |
| Drawing title | | Drawing number | | |
| Tree Constraints Plan | | DFC4363_TCP | | |
| Orientation | | Revision | | |
| | | A | | |
| | | Drawn | | |
| | | PJR | | |
| | | Authorised | | |
| | | Drawing status | | |



Since the survey was carried out
T27 has died and been removed

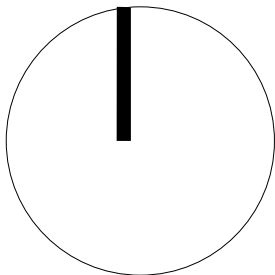
Appendix 5

Tree protection plan DFC 4363 TPP



- Category A – High quality and value
- Category B – Moderate quality and value
- Category C – Low quality and value
- Category U – Unsuitable for long-term retention
- RPA – root protection area as defined by Table 2 BS 5837: 2012
- Crown Spread of Tree to be Retained
- Protective Fencing
- Ground Protection
- Crown Pruning
- Area Subject to Arboricultural Method Statement (AMS)

| | | | | |
|---|-------------|--------------------------|------|----------------|
| A | | Death and removal of T27 | PJR | 08.05.2020 |
| Revision | Description | Drawn | Date | |
| D F Clark | | | | |
| Bionomique Ltd | | | | |
| Client | | | | Date |
| London Borough Of Camden | | | | 09.11.19 |
| Site address | | | | Scale |
| Chester Road Hostel, Chester Road, Highgate | | | | 1:150@ A1 |
| Drawing title | | | | Drawing number |
| Tree Protection Plan | | | | DFC4363_TPP |
| Orientation | | | | Revision |
| | | | | A |
| | | | | Drawn |
| | | | | PJR |
| | | | | Authorised |
| | | | | Drawing status |



Appendix 6

Tree surgery schedule

Tree surgery recommendations

All tree works to be undertaken in accordance with *BS 3998:2010 Recommendations for tree works*, or industry best practice.

Where appropriate, arisings from tree works should be retained on site as ecological habitat features.

| Table 5 | | | |
|----------|---------------------|--|--|
| Tree no. | Species | Proposed works | Reason |
| T3 | False acacia | Reduce back to previous points on eastern aspect | To provide clearance from proposed building |
| T4 | Lime | Fell and remove stump | Too Close to proposed building |
| G5 | Cotoneaster & lilac | Fell and remove stump | Too Close to proposed building |
| T6 | Apple | Fell and remove stump | Conflicts with proposed building |
| T7 | Rowan | Fell and remove stump | Conflicts with proposed building |
| T8 | False acacia | Fell and remove stump | Conflicts with proposed building |
| T9 | Cotoneaster | Fell and remove stump | Too Close to proposed building |
| T10 | Cherry | Crown reduce on south-western aspect by 2.5m | To provide clearance from proposed building |
| T12 | Silver maple | Crown lift on western aspect to 3.5m, and laterally reduce crown above by 2.5m | To provide clearance from proposed building |
| T13 | Apple | Fell and remove stump | Conflicts with proposed building |
| T14 | False acacia | Fell and remove stump | Conflicts with proposed building |
| T15 | Cherry | Fell and remove stump | Conflicts with proposed footpath & level changes |
| T17 | Rowan | Fell and remove stump | Too Close to proposed building & level changes |
| T18 | Cherry | Fell and remove stump | Too Close to proposed building and level changes |

Appendix 4

Tree protection barriers & ground protection

Design of welded mesh, Heras type tree protection barrier

Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place. The default specification should be in accordance with 6.2.2.2 of BS 5837, as set out below.

Specifications: Barrier shall be a minimum 2 m high. It shall consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated below. The vertical tubes should be spaced at a minimum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. See Figure 2 overleaf.

Where site circumstances and associated risk of damaging incursions into the RPA do not necessitate the default level of protection, an alternative specification may be used if agreed with the local authority. An example would be 'Heras' type welded mesh panels on rubber or concrete feet. The panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The panels should be supported on the inner side by stabiliser struts. See Figure 3 overleaf. All-weather notices should be attached to the barrier with words such as 'TREE PROTECTION ZONE - NO ACCESS'.

Location: Barriers shall be positioned on the perimeter of the Root Protection Area to define the Tree Protection Zone or as specified in the Tree Protection Plan.

Shown on the Tree Protection Plan by a dashed black line

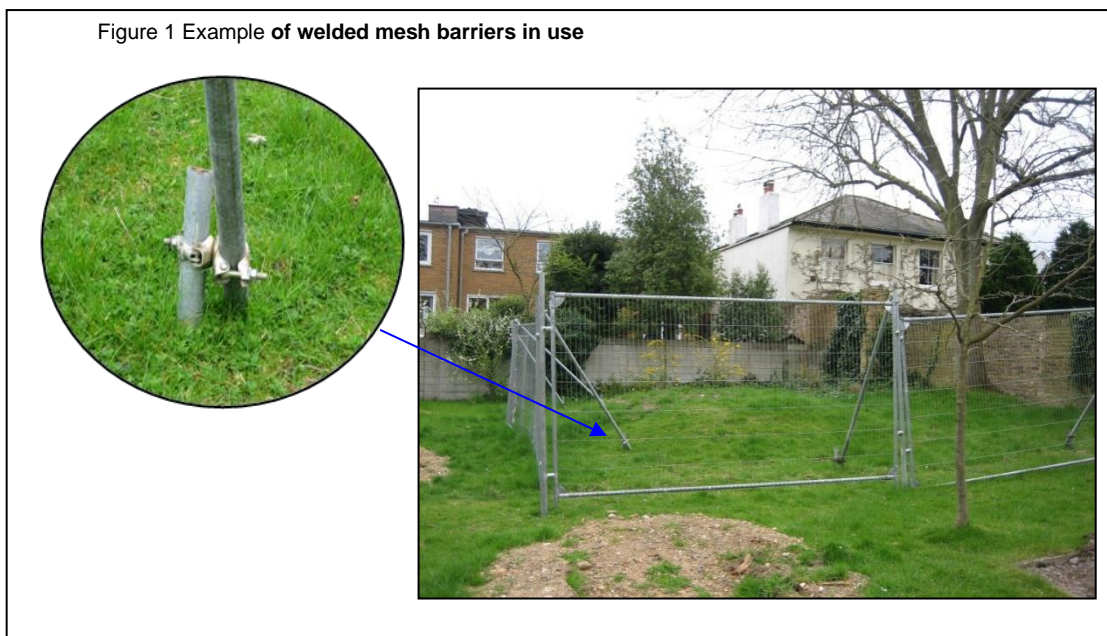


Figure 2 Default specification for protective barrier

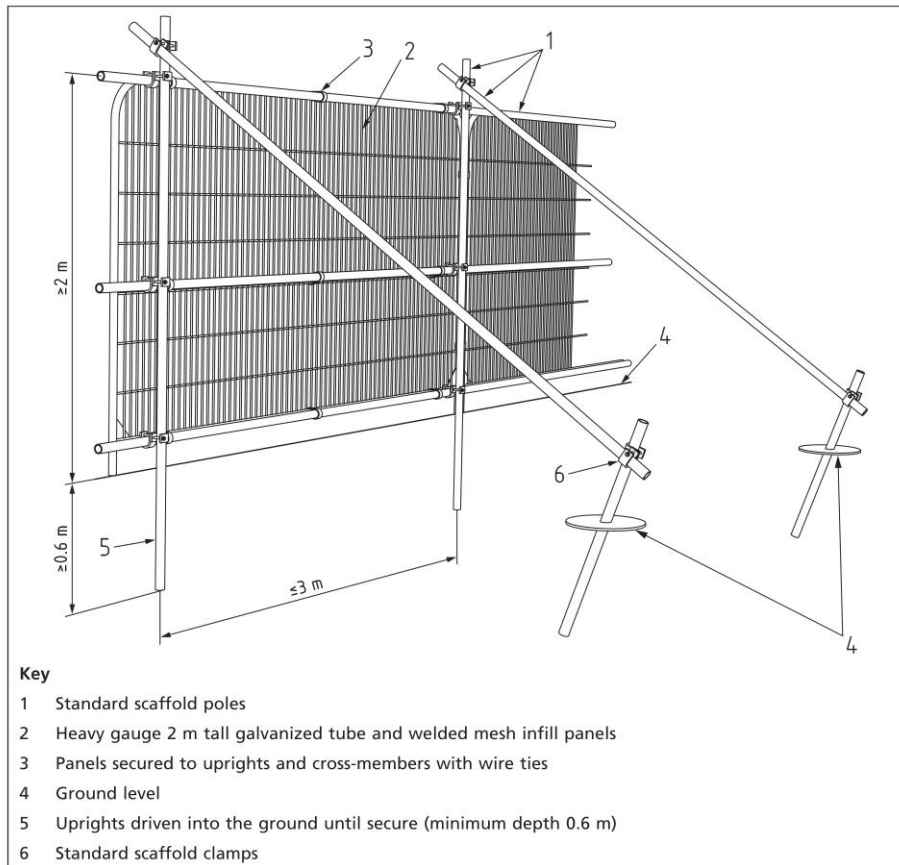
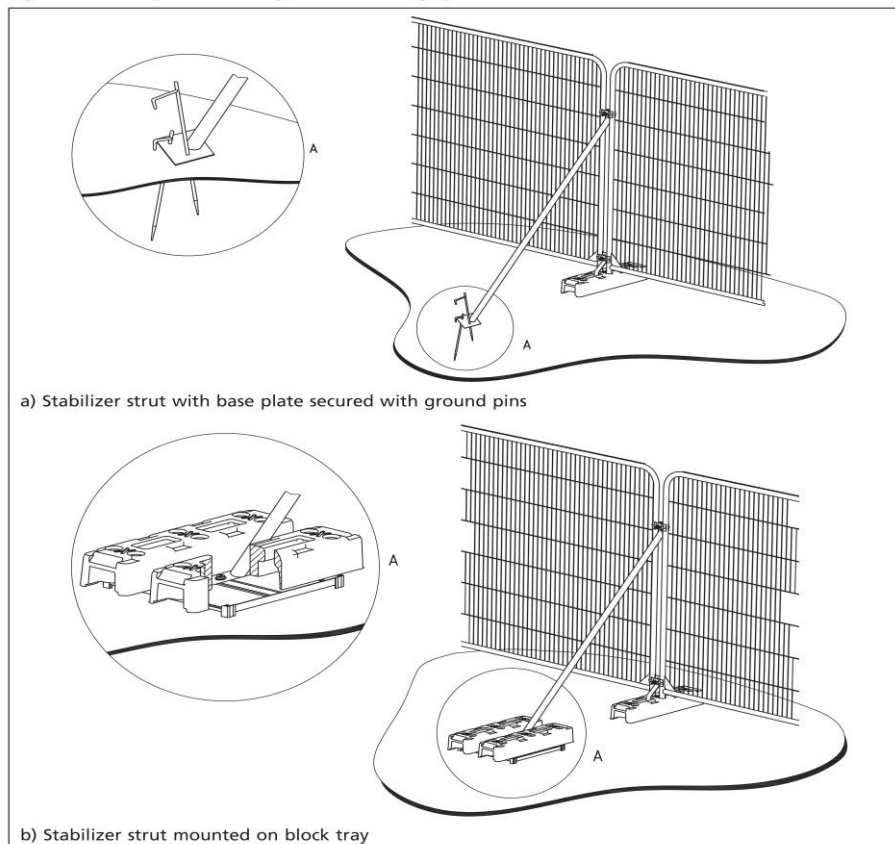


Figure 3 Examples of above-ground stabilizing systems



Figures above are reproduced with the permission of the British Standards Institute.

Suggested protective fencing warning sign format



Ground protection

In areas where it is not possible to erect protective fencing, ground protection must be used to protect the TPZ of trees. Where it has been agreed during the design stage, and as shown on the tree protection plan, that vehicular or pedestrian access for the construction operation may take place within the TPZ, the possible effects of construction activity should be addressed by a combination of barriers and ground protection. The position of the barrier may be within the TPZ at the edge of the agreed working zone but the soil structure beyond the barrier to the edge of the TPZ should be protected with ground protection. **This must be installed before any site activity takes place to protect soil structure and tree roots.**

Ground protection must be fit for the purpose of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil. It might comprise one of the following:

- For pedestrian movements or the erection of scaffolding within the RPA the installation of ground protection in the form of a single thickness of scaffold boards either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip laid onto a geotextile).
- For pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards or panels placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane.
- For wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

The following is a list of suppliers of temporary ground protection including polymer, metal or wooden panels. Other companies supply similar products and the following are given only as an example.

- www.ground-guards.co.uk
- www.evetrakway.co.uk
- www.trakmatseurope.com
- www.centriforce.com
- www.marwoodgroup.co.uk

Cellular confinement no-dig systems can also be used.

Examples of proprietary ground protection panels



Green-Tek Ground Guards showing geotextile membrane, 100 mm of woodchip with panels above protect tree roots

Appendix 8

Specific report caveats

Specific report caveats

- The survey was based on a drawing provided by the client.
- No internal diagnostic equipment was used other than a sounding mallet and probe.
- The survey is concerned solely with arboricultural issues.
- Any work with trees will discharge the due diligence requirements of all relevant wildlife and countryside legislation.
- Trees are dynamic living organisms whose health and condition can change rapidly. Any changes to the tree or conditions close to the tree may change the stability and condition of the tree and a further examination would be required and may affect the validity of this report.
- This report is valid for 12 months.

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Arboricultural Impact Assessment
At
Chester Road Hostel, Chester Road, Highgate
On behalf of
London Borough of Camden

8th May 2020
Our Reference DFC 4363 Rev A

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