



ARBORICULTURAL CONSULTANTS

ARBORICULTURAL IMPACT ASSESSMENT

FOR

4 ELY PLACE,

CHIGWELL,

ESSEX

IG8 8AG

By

ARBORICULTURAL SOLUTIONS LLP

ORIGINAL – JULY 2021.

SUMMARY

The purpose of this report is to provide a consideration of the arboricultural implications of the proposed extension works. Trees considered to be within the influencing distance of the development have been assessed in accordance with BS5837:2012 "Trees in relation to design, demolition and construction – Recommendations". I have inspected all the trees on and near the site that could potentially be affected by the development and list their details in Appendix A and as a result, two trees were inspected. The implications of the proposal are:

1. Trees 1 and 2 will be retained trees will be protected in accordance with BS 5837:2012 specifications throughout the development.
2. The proposed works at ground level are confined to the excavation of 3 x post holes at the front of the property and the reduction of the existing planting area to increase the parking area. The proposed development is unlikely to impact significantly on the retained trees.

This report includes guidance on tree protection measures and providing these are adhered to there will be no adverse impact on the long-term potential on the retained trees.

1. Introduction

1.1. Instructions

1.1.1. We are instructed to inspect and report on trees growing in the vicinity of the proposed development. We are to report on their current condition, amenity value, suitability for retention and comment on any potential impacts on the trees from proposed development and provide guidance on any necessary tree protection.

1.2. Drawings and Documents

1.2.1. We can confirm sight of the following documents and drawings:

- Location and block plan at scales 1:1250 and 1:500@A3 dated August 2016.
- Existing and proposed plans at scales 1:50 and 1:100 dated April 2021.
- Existing and proposed elevations at scale 1:100 dated April 2021.
- Epping Forest District Council Tree Officer comments dated 10th June 2021.

2. Report on site visit

2.1. General

2.1.1. The site was inspected on 28th June 2021 by F. Critchley of Arboricultural Solutions LLP. All arboricultural data contained in this report was recorded at that time. Weather conditions were overcast with light drizzle and with good visibility.

2.1.2. The relevant data was recorded to assess the condition of the trees, their potential constraints on the proposed development and the protection and construction measures required to ensure their long-term retention.

2.1.3. Information is given on condition, size and indicative positions in accordance with British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*.

3. Tree inspection and methodology

3.1. Inspection

3.1.1. Trees likely to be affected by the development were identified and inspected from ground level only. The trees were inspected based on the Visual Tree Assessment (VTA) method as proposed by Mattheck and Breloer (1994) and were not climbed. No invasive examination technique (such as increment boring, or internal decay detection) was carried out. As the inspection was visual only, no guarantee, either expressed or implied, of the internal condition of the wood of these trees can be given.

3.2. Marking

3.2.1. Trees were plotted by triangulation from set points (using a laser rangefinder Leica Disto D510) onto a scaled block plan purchased online. Crown measurements were taken using a laser rangefinder (Leica Disto D510). The trees surveyed were referenced with a number corresponding to the particular tree on the site plan.

3.2.2. Each reference number refers to a survey sheet entry completed on site to show the following data:

- Sequential tree reference number (recorded on tree survey plan)
- Species - Common name followed by the Latin name for the first entry of each different species
- Height in metres
- Trunk diameter in millimetres, measured in accordance with Annex C of BS 5837:2012
- Crown radius measured at the four cardinal points – where only one measurement is given, the crown is symmetrical
- First significant branch height and direction of growth
- Crown clearance above ground level
- Life stage (young, semi-mature, early mature, mature, over-mature, veteran)
- General observations, particularly of structural and/or physiological condition, and/or preliminary management recommendations
- Estimated remaining contribution in years (less than 10, 10+, 20+, more than 40)
- Category U or A to C grading, to be recorded on the tree survey plan

3.2.3. Survey sheet entries are shown at Appendix A of this report.

3.3. Tree categorisation

3.3.1. Trees vary in, size, age, and landscape importance. All trees were categorised in accordance with the British Standard Trees in relation to design, demolition and construction - recommendations BS 5837: 2012. BS Categories have been entered in the tree schedule and are as follows:

U – Trees unsuitable for retention. Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

A - High Category. Trees of high quality with an estimated remaining life expectancy of at least 40 years.

B - Moderate Category. Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

C - Low Category. Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.

3.3.2. The site plan was edited to produce a Tree Constraints Plan (TCP) showing the constraints on the existing site layout (refer to drawing TCP_4ELYPLACE_1 Rev A). This information is then used to produce a tree protection plan (refer to drawing TPP_4ELYPLACE_2 REV A).

3.3.3. The root protection areas (RPAs) have been calculated using Trees in Relation to Design, Demolition and Construction - recommendations BS 5837: 2012 (refer to Appendix A). The RPAs of trees implicated in the design proposal have not been adjusted in shape to take into account the existing or past site conditions such as the presence of buildings, boundary walls or hard surfacing. Whilst the presence of boundary walls and buildings may restrict root spread, hard surfaces such as tarmac/paved footpaths are likely to have roots present beneath them but at a reduced volume. In this case, the full RPAs have been retained to show the areas where special precautions are required to prevent potential damage to the roots.

3.3.3. The trunk diameter circle and crown outline show the BS Category in the following colours:

Category U	Dark red
High Quality (A)	Light green
Moderate Quality (B)	Mid-blue
Low Quality (C)	Grey

3.3.4. Trees in Relation to Design, Demolition and Construction - Recommendations BS 5837: 2012 do not include arguments for or against development, or for the removal or retention of trees. Where development is likely to occur, the standard provides guidance on how to decide which trees are appropriate for retention.

4. Brief Site Description

4.1. General

4.1.1. 4 Ely Place stands on the north side of the cul-de-sac. The immediate surrounding area is mainly medium density, residential properties constructed circa 1980. The house is a two-storey, detached property and is approximately southeast facing. The property has been extended with the addition of a single storey side extension constructed circa 2010. There is an existing detached, single storey garage. The property occupies a rectangular shaped level plot and has off-street parking to the front and an enclosed rear garden.

4.2. Statutory Tree Protection

4.2.1. The Town and Country Planning (Tree Preservation) (England) Regulations 2012 allows for trees either as groups, or individuals, or as woodlands, to be protected by Tree Preservation Orders (TPO). These have the effect of preventing the cutting down, topping, lopping, uprooting, wilful damage or wilful destruction of trees except in certain circumstances, other than with the consent of the local planning authority.

4.2.2. A Conservation Area is an area designated by the Local Planning Authority as one of "special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance". Special controls exist with regard to demolition and alteration of buildings; Listed Building Consent must also be obtained for any demolition, even if the building is not itself listed. Similarly, trees are given some protection with the requirement for

the local authority to be given six weeks written notice before carrying out any work on trees; this gives the authority time to decide if a TPO is necessary.

4.2.3. The property is not within a Conservation Area. The trees surveyed are subject of TPO (reference TPO/EPF/09/11 T42 and T43) administered by Epping Forest District Council.

4.3. Development Proposal

4.3.1 The development proposal is for a first-floor side extension above the existing single storey side extension, repositioning of front entrance door, downlighting to front elevation and first floor landing window.



Photograph 1 showing the existing front elevation of 4 Ely Place.



Photograph 2 showing the existing rear elevation of 4 Ely Place.

5. Tree Population

5.1. Tree schedule

5.1.1. As noted in sections 2.1.3. and 3.2, inspection of the trees followed a defined protocol as per BS 5837:2012 to ensure a systematic and consistent approach and assessment of the condition and value of the trees.

5.1.2. Refer to appendix A for detailed records of the individual tree and drawing Tree Constraints Plan (drawing number TCP_4ELYPLACE_1 Rev A) for the locations of the trees. Trees that have been surveyed and included as groups have not been included in the following tree population analysis.

Species	Age Class	BS Category	Total Number
Common Oak	M	B2	2

5.1.3. Trees 1 and 2 are mature Oaks adjacent to the house. Tree 1 is located within the rear garden of 3 Ely Place and tree 2 at the front of 4 Ely Place. The trees are generally in good condition and of normal vigour and predate the construction of the houses in Ely Place. Both trees are managed by crown reduction and there is a current approved consent to reduce the overhanging branches of tree 1 by up to 2m metres and reduce the lateral branches of tree 2 by 2 metres.



Photograph 3 showing tree 1 within the rear garden of 3 Ely Place.



Photograph 4 showing tree 2 at the front of 4 Ely Place.

6. Arboricultural Impact Assessment

6.1. Impact on Trees

6.1.1. Existing trees are an important factor on construction sites, whether on or near the working areas. BS5837:2012 – “Trees in relation to design, demolition and construction – Recommendations” is intended to assist decision-making with regard to existing and proposed trees in the context of design, demolition and construction. Root systems, stems and canopies, with allowance for future movement and growth, need to be taken into account.

6.1.2. BS5837:2012 - Trees in relation to design, demolition and construction – recommendations have been used to calculate the RPAs. It should be noted that this method is primarily used to calculate the volume of soil required to maintain healthy growth based on the trunk diameter of the tree. In practice, roots may extend beyond this area, and in some cases the spread may be less. The majority of a tree's root system is generally considered to be in the top 600mm of the soil, extending radially in any direction for distances frequently in excess of the tree's height.

6.1.3. The proposed extension is to the first floor only above the existing single storey extension. This does not require any construction work at ground level, it does not encroach into the RPAs and will have no impact on trees 1 and 2. These trees will be retained and protected in accordance with BS 5837:2012 specifications.

6.1.4. There is an existing TPO consent to cut back the overhanging branches of tree 1 by up to 2 metres. This will remove the overhanging branches and clear the aerial space above the existing extension and so allow the construction of the first-floor extension.

6.1.5. The repositioning of the front door to the front elevation and the construction of the proposed canopy will require minor changes existing front elevation and minor excavations for the installations of 3 x Oak posts to support the canopy. This work is within the RPA of tree 1 but the excavations are minimal and will not impact on the health or stability of this tree.

6.1.6. The proposal includes reducing the size of the existing planting area around tree 1 to increase the car parking area. This can be constructed using a cellular confinement system with a permeable finishing surface to allow moisture infiltration and gaseous diffusion.

6.2. Tree Protection Plan (TPP)

6.2.1. The TPP illustrates the location of the protective barriers and must be displayed on site in a highly visible area so that all staff involved in the works have a point of reference for tree protection issues.

6.3. Construction Exclusion Zone (CEZ)

6.3.1. For the purpose of this report the CEZ can be defined as all the area within the RPAs of retained trees outside the work areas and the areas behind the tree protection fencing.

6.3.2. Site operations are not permitted in the CEZs without reference to the Arboricultural Method Statement in this report (refer to section 8 of this report).

7. Development

7.1. Threats to trees during development

7.1.1. These may be listed, in general terms as:

- Compaction of ground
- Covering rooting areas with impervious surfaces
- Excavations for foundations
- Excavation for service runs
- Alterations in ground level
- Access and movement of machinery
- Need for temporary site storage
- Crown damage by passage of high-sided vehicles

7.1.2. British Standard 5837 (1991) 'Trees in relation to construction' provided useful guidance for the assessment and formulation of measures for the mitigation of such threats. Using the experience gained from this Standard, it was revised and upgraded to 'Recommendation' status as British Standard 5837 'Trees in Relation to Construction' (2005). This British Standard was withdrawn on 30th April 2012 and replaced with Trees in Relation to

Design, Demolition and Construction - Recommendations BS 5837: 2012. To assist in the prediction of the likely impact of development on retained trees, a model is used. This model is based on the age, vitality and size of individual specimens.

7.1.3. The British Standard relies heavily on the creation of a protected zone (RPA) around each tree. This area should be protected from disturbance “in order to avoid unacceptable damage to the tree as a result of severance or asphyxiation of the root system.” The recommended minimum area (m²) for each tree to avoid potentially harmful disturbance have been calculated for all the trees on site and entered into the tree schedule (appendix A).

7.1.4. BS 5837: (2012) acknowledges that the shape of the tree root system may be affected by several factors and that the shape of the RPA should reflect this. Any deviation in the RPA from the original circular plot should take account of the following factors whilst still providing adequate protection for the root system:

- a) The morphology and disposition of the roots, when influenced by past or present existing site conditions (e.g. the presence of roads, structures and underground apparatus).
- b) Topography and drainage.
- c) Likely tolerance of the tree to root disturbance or damage based on factors such as species, age, condition and past management.

7.2. Root Damage

7.2.1. Trees that are growing satisfactorily have achieved equilibrium with their surroundings. Any construction work that affects this equilibrium could be detrimental to health, future growth and the safety of the tree.

7.2.2. The part of the tree most susceptible to damage is the root system, which, because it is not immediately visible, is frequently ignored. Damage or death of the root system will affect the health, growth, life expectancy and safety of the rest of the tree. The effects of such damage may only become evident several years later.

7.2.3. The majority of a tree's root system is generally considered to be in the top 600mm of the soil, extending radially in any direction for distances frequently in excess of the tree's height. However, roots are adventitious and if conditions suitable for root development exist to a greater depth, the roots may extend to depths of three metres or more. Works within the root spread may damage the root system.

7.2.4. Close to the trunk are the main structural roots that develop in response to the tree's need for structural stability. Beyond these major roots, the root system rapidly subdivides into smaller diameter roots; off this main system a mass of fine roots develops.

7.2.5. Tree root systems can be damaged in a number of ways during construction works.

- **Root severance.** Severing of a root will destroy all parts of the root beyond that point. Even roots less than 10mm diameter may be serving a mass of fine roots over a large area. The larger the root severed, the greater the impact on the tree.
- **Damage to root bark.** The bark protects the root and is essential for further root growth; it is loosely attached and easily damaged. If damage extends around the whole circumference, the root beyond that point will be killed.
- **Compaction of the soil.** Compaction of the ground reduces the space between soil particles, particularly in clay soils. A single passage of heavy equipment or the storage of materials can cause significant damage. Compaction can restrict or even prevent gaseous diffusion through the soil and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.
- **Alterations in ground levels.** Lowering the level will strip out the mass of roots near to the surface. Raising the ground levels will have the same effect as compaction.
- **Covering the rooting area with impervious surfaces.** This prevents natural diffusion of gases between the soil and the atmosphere and can lead to oxygen depletion in the soil.
- **Direct toxicity of some materials.** For instance, petrol or diesel spillage or lime in cement can kill underlying roots.
- **Wounding.** Minor wounds to root bark can allow pathogens into the tree root system that can lead to a further impairment of water absorption. The general debilitation of trees due to root severance can make them more susceptible to invasion by some decay fungi such as *Armillaria* spp.
- **Damage to the fine roots** by severance of a main root, or by compaction, or by alteration of levels, will prevent the fine roots absorbing the water and nutrients essential for tree growth. The effects of damage from different causes will be cumulative.

7.2.6. The effects of tree root damage may not be immediately apparent. If the root system is capable of rapid regeneration, the tree may recover without noticeable ill effects, though usually symptoms take several years to develop. The range of symptoms varies from minor branch dieback, to deterioration and ultimate tree death depending on the severity of the damage and the ability of the roots to regenerate.

7.2.7. The default position should be that structures are located outside the RPAs of trees that are to be retained. The cumulative effects of incursions into the RPA e.g. from excavations for utility apparatus are damaging and should be avoided. Where there is evidence that a tree has been previously subjected to damage by construction activity this should be taken into account when considering the acceptability of further activity within the RPA.

8. Arboricultural Method Statement

8.1. Undertake Approved Tree Works.

8.1.1. All tree works should be undertaken prior to any site works commencing. Motorised vehicles will be restricted to areas of existing compacted/hard surfaces, or where ground protection is in place, and should not be taken onto un-surfaced areas within the root protection areas (as shown on drawing TPP_4ELYPLACE _2 Rev A). Refer to Table below for tree works.

Tree No.	Recommended Works
T1 & T2 (Oak)	T1 – Crown reduce overhanging lateral branches by up to 2 metres. T2 - Crown reduce lateral branches by up to 2 metres.

NB: All tree works must be carried out in accordance with the British Standard Recommendations for Tree work, BS 3998:2010 as modified by later research.

8.2. Tree protection with barriers and ground protection.

8.2.1. Tree 1 is within the rear garden of the neighbouring property with the existing boundary treatment preventing construction access to the tree. Tree 2 stands at the front of the property. Protective fencing will be installed around the existing soft planting area. The fencing will consist of a scaffold pole frame mounted with solid hoarding; the frame must be cross braced to prevent accidental movement as defined in Trees in relation to design, demolition and construction - recommendations BS 5837: 2012.

8.2.2. As construction access is required around the house, any root protection area outside the protective fencing will be subject to ground protection restrictions as shown on the tree protection plan (TPP_4ELYPLACE _2 Rev). The existing hard surfacing will be appropriate for pedestrian access.

8.2.3. All materials storage and mixing will be confined to areas outside the RPAs of all retained trees and confined to areas where ground protection has been installed. Where mixing of materials is undertaken close to the RPAs, this should be on an impervious surface with no run-off to prevent chemical contamination of the RPAs.

8.2.4. All tree protection measures **must** be in place before any works commence or materials or machinery is brought onto site. Ground protection **must** not be moved or altered without prior consultation with the arboriculturalist or Local Authority Tree Officer. Protection measures will remain in place throughout the following processes:

- Contractor occupancy
- Plant and materials delivery
- Demolition/construction works
- Installation of utilities
- Completion of development

8.2.5. Protective fencing must be clearly marked using a warning sign such as the example shown in Fig 3. If a protective fence requires temporary repositioning, ground protection must be used within the exposed RPAs unless there is existing hard surfacing.

8.2.6. Once the construction exclusion zone (CEZ) has been protected by barriers and/or ground protection, demolition/construction can take place. Inside the Construction Exclusion Zone (CEZ) of the protective fencing, the following prohibitions shall apply:

- No mechanical digging or scraping.
- No hand digging.
- No storage of plant, equipment or materials.
- No vehicular or plant access.
- No fire lighting.
- No washing down of vehicles or machinery.
- No handling, discharge or spillage of any chemical substance, including cement washings.
- No action likely to cause localised waterlogging.
- No change in ground levels.
- No construction of a hard surface.
- No earthworks.
-

8.3. Installation and/or upgrading of existing services

8.3.1. The proposed first floor extension will make use of the existing services and no additional excavations are required.

8.4. Installation of new Surfaces

8.4.1. Changes of surfacing within RPAs is potentially very damaging as it usually involves changes in gradient/levels that may lead to root damage. As cement is toxic to roots, any excavations close to the RPAs must be lined with an impermeable membrane to prevent concrete leachates being exposed to roots.

8.4.2. Cellular confinement systems can be used in areas where tree root damage would be caused by digging into the ground to lay a conventional sub-base for new hard surfacing and where the long-term viability of trees could be harmed if soil that they may depend upon is at risk of becoming compacted. Compaction can occur for many reasons but vehicles passing over unreinforced ground are particularly damaging, although repeated foot traffic can also be detrimental to soil structure.

8.4.3. A cellular confinement system is a series of geocells arranged in a honeycomb-like formation that is combined with an underlying geotextile and angular stone to spread loads in such a way as to minimise compaction of underlying soil. Due to its 3-dimensional structure, a geocell mat offers all-round confinement to the encapsulated material, which provides a long-term improvement in the performance of the sub-base. When a surface is reinforced in this way the load is distributed over a larger area of the subgrade-base interface, leading to lower vertical stress and reduced deformation of the subgrade. (Refer to Appendix C Fig 4. for an example of this phase of construction).

8.4.4. The finished surface can be either a granular material or permeable and gas-porous wearing surface (porous paving/tarmac or resin bound gravel) to allow moisture infiltration and gaseous diffusion. It is essential to maintain adequate supplies of water and oxygen for trees through the soil. Porosity is important particularly where the new hard surface covers an area of previously unmade ground, under which tree roots may have developed preferentially.

8.4.5. No-fines granular materials should be used wherever fill or a sub-base is required to help to ensure adequate gaseous diffusion. Excess water in the root protection area should be avoided, particularly on clay soils where water logging can occur.

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

8.5. Lightly founded structures

8.5.1. The supporting posts for the canopy are within the RPA of tree 2, the excavations for supporting posts/foundations should be excavated by hand to ensure no roots are present. If significant roots >than 25mm diameter are found it may be possible to cut them under advice from a suitably qualified arboricultural professional. If the roots have to remain, the design should be suitably flexible to allow repositioning of any foundation structure. Any design involving concrete must utilise an impermeable membrane in the excavation to prevent concrete leachates contacting roots.

8.6. Other tree-related site works

8.6.1. **Pre-commencement site visit:** This is a small-scale development not requiring significant tree protection measures and therefore it is not considered necessary to arrange site meetings for this aspect. Any modifications to the proposed development may require that the tree report is updated.

8.6.2. **Site supervision:** Site visits by the project arboriculturist may be required by the local planning authority, particularly if works are proposed within the RPAs of retained trees. Once the site is active, the project arboriculturist will ensure compliance with arboricultural conditions and advise on tree problems or any modifications that may arise. The developer must ensure that all conditions of the arboricultural method statement and any amendments are known and fully understood by all site personnel. All personnel engaged in works near trees must have access to written copies of the method statement and understand the content before working near trees.

9. General

9.1.1. Arboricultural Standards: Any tree works should be done in accordance with the British Standard Recommendations for Tree work, BS 3998 as modified by later research. Works should be undertaken by properly qualified and experienced tree contracting company as

recommended by a local authority or one approved by the Arboricultural Association. A Register of Contractors is available from:

The Arboricultural Association
The Malthouse
Stroud Green
Standish
Stonehouse
Gloucestershire GL10 3DL
UKTel +44 (0) 1242 522152
Fax +44 (0) 1242 577766
Email: admin@trees.org.uk.

9.1.3. Statutory wildlife implications: Wildlife in this country is afforded protection under the Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000. Statutory protection is given to birds, bats and other species that inhabit trees. Tree work is governed by these statutes and advice should be sought from an ecologist before undertaking any works that may constitute an offence.

- If the intention is to complete tree work between the 1st of March and the end of August, a due diligence check for nesting birds must be completed before work starts in order to comply with the Wildlife & Countryside Act 1981. Arborists should record such checks in their site-specific risk assessment. If active nests are found work should not take place until the young have fledged.
- A due diligence check for bats and likely habitats must be completed before work starts in order to comply with the Wildlife & Countryside Act 1981. Arborists should carry out and record such checks in line with BS8596:2015 Surveying for bats in trees and woodland in their site-specific risk assessment. If bats or potential roosting features are found work must not start until an appropriately licenced bat handler has been engaged.

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APPENDIX A TREE SCHEDULE 4 ELY PLACE CHIGWELL ESSEX IG8 8AG.

Tree No.	Species	Height (m)	Stem No.	DBH (mm)	Crown radius (m)				Lower crown height (m)	Life stage	Condition Comments	Est. Rem'ing contrib'n	BS Cat	RPA (m²)	RPA as circle of radius (x)m
					N	E	S	W							
1	Common Oak	14	1	500	6	4.5	6	5	6	M	Tree subject to TPO. Diameter estimated. In neighbouring property. Average condition. Normal vigour. Basal areas not visible due to decking. Bark wounding on trunk. Limb removed north side at 1m. Occluded wounds on trunk. Trunk bowed to west from 2.5m height. Bark wounding/trunk bulge at 0.5 to 1.5m on east side. Previously crown reduced. Decay pockets in pruning wounds. Light deadwood in crown. Branches encroaching upon building. Contributes to general amenity of area. Some landscape amenity value. Contributes to low level screening.	40+	B2	113.1	6

Tree No.	Species	Height (m)	Stem No.	DBH (mm)	Crown radius (m)				Lower crown height (m)	Life stage	Condition Comments	Est. Rem'ing contrib'n	BS Cat	RPA (m²)	RPA as circle of radius (x)m
					N	E	S	W							
2	Common Oak	17	1	570	5.5	6	6	5	6	M	Tree subject to TPO. Good condition. Normal vigour. Soil levels raised around base. Tree located within hard surface area. Unable to inspect stem due to Ivy. Occluded wounds on trunk. Possibly topped at 9m. Previously crown reduced. Decay pockets in pruning wounds. Unbalanced crown shape. Branches encroaching upon building. Contributes to general amenity of area. Some landscape amenity value. Contributes to low level screening.	40+	B2	147	6.84

KEY

Y = Young
SM = Semi-mature
EM = Early-mature
M = Mature
OM = Over-mature
V = Veteran

H = Hedge G = Group B = Shrubs
K = Small tree

W = Woodland
RPA-R (m) = RPA of radius x metres

Appendix B TREE QUALITY ASSESSMENT CASCADE CHART

Category and definition	Criteria (including subcategories where appropriate)		
Trees unsuitable for retention Category U	Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	<ul style="list-style-type: none"> • Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <p><i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve</i></p>	
Trees to be considered for retention	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value

APPENDIX C TREE PROTECTION

1.1. Pre-commencement site meeting.

1.1.1. A pre-commencement site meeting is advised prior to any works commencing on site, to agree all the approved processes with the relevant concerned parties.

1.2. Protective fencing and ground protection.

1.2.1. All trees to be retained on site should be protected by barriers and ground protection where applicable. Barriers should be in place before any materials or machinery is brought onto site. Once in place, barriers and ground protection should be considered sacrosanct and should not be altered or removed without prior recommendation by an arboriculturist and approval of the local planning authority. Barriers should be fit for excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.

1.2.2. The protective fencing is to be erected prior to any site works or demolition works.

1.2.3. The barrier is to comprise of a vertical and horizontal framework (Figure 1 below), well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3m. Weldmesh panels, such as Heras, should be securely fixed with wire or scaffold clamps to this framework. Weldmesh panels on rubber or concrete feet are not resistant to impact and should not be used. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a freestanding scaffold support framework.

1.2.4. Where retained trees are near the existing buildings, a higher specification hoarding will be required to prevent damage from falling rubble. In place of the weldmesh, panels solid hoarding should be used, for example, scaffold boards.

1.2.5. Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturist and, where relevant, agreed with the local planning authority. For example, 2 m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence 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 distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 2 below). Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray

1.2.6. It is advised that a plan be pinned up on site in highly visible areas such as in the site huts, so that all ground staff involved in the demolition and construction works have a point of reference for tree protection issues. All demolition and construction workers should be briefed on the importance of tree protection prior to works commencing. Special attention must be paid to ensure that protective fencing remains rigid and complete during all works.

1.2.7. Where it is agreed that vehicular or pedestrian access for construction purposes is necessary within the RPA, ground protection measure will be required to prevent damage to the soil structure within the RPA.

1.2.8. For pedestrian access within the RPA, the installation of ground protection in the form of a single thickness of scaffold boards over a compressible layer laid onto a geotextile, or supported by scaffold, is likely to be acceptable.

1.2.9. For wheeled or tracked vehicle, access within the RPA the ground protection should be designed by an engineer to accommodate the likely loading and may involve the use of proprietary systems or reinforced concrete slabs. The structure must use a no dig design (see methodology described in 1.7 below) to prevent root severance and must prevent localised soil compaction by distributing the load across the track width. Such a system may include the use of three-dimensional cellular confinement systems (CCS) as a component of the sub-base, to act as a load suspension layer.

1.2.10. New permanent hard surfacing should not cover more than 20% of the RPA or be wider than 3m within it; it should be constructed to be permeable to moisture and gas.

1.3. Construction exclusion zone

1.3.1. Once the construction exclusion zone (CEZ) has been protected by barriers and/or ground protection, demolition/construction can take place.

Inside the Construction Exclusion Zone (CEZ) of the protective fencing, the following prohibitions shall apply:

- No mechanical digging or scraping.
- No hand digging.
- No storage of plant, equipment or materials.
- No vehicular or plant access.
- No fire lighting.
- No washing down of vehicles or machinery.
- No handling, discharge or spillage of any chemical substance, including cement washings.
- No action likely to cause localised waterlogging.
- No change in ground levels.
- No construction of a hard surface.
- No earthworks.

1.3.3. To inform site personnel of the purpose of the fencing, information notices shall be fixed to the fencing at 5m intervals. These notices shall be of all-weather construction and shall be in the form of the example provided at Figure 4 below, and replaced as and when necessary.

1.3.4. In addition to the above, further precautions are necessary adjacent to trees outside the CEZ:

- Materials that will contaminate the soil, e.g. concrete mixing, diesel soil and vehicle washings, should not be discharged within 10 metres of the tree stem. This should take into consideration the topography of the site and slopes to avoid materials such as concrete washings running towards trees.
- Fires should 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 the tree.

1.4. New Services

1.4.1. **Service connections:** The location of all new service routes should ideally be outside of the root protection zones of the trees to be retained to avoid damage to tree roots. All proposed service installations should be carried out in accordance with the guidelines set out in NJUG Publication No.10, and Section 11.3.5 and 11.7 of BS5837:2005. Great care should be taken to preserve and work around roots greater than 25mm in diameter, and clusters of smaller roots avoiding damage to bark. Where it is necessary to sever roots greater than 25mm in diameter, arboricultural advice must be sought. Where smaller roots must be severed, they should be cut back cleanly using secateurs or a sharp pruning saw. Where possible, services laid through protected areas need to be installed at a depth preferably not less than 750mm deep in order to preserve the maximum number of roots, and avoid conflicts between the tree roots and the utility service run. The trench should be kept as narrow as possible to reduce the potential amount of root severance. Backfilling of trenches should be carried out using the excavated soil, which should be worked in around roots and lightly "tamped" not compacted and preserving the original soil profile. The backfill should be left proud of surrounding levels to allow for settlement. Trenches must not be left open overnight, and arboricultural supervision should be provided during excavation of trenches through protected zones. If the trench is to remain open for any period during the day to prevent the roots from drying out, it is advised that moist Hessian sacking be wrapped around the exposed roots, and/or trench to prevent desiccation from occurring. All existing site services that are already within the root protection areas that are to be made redundant will still need to comply with the above to prevent any damage to roots within these areas.

1.5. Removing Surfacing in RPAs

1.5.1. Roots are frequently found beneath or adjacent to existing surfacing or built structures and care is needed. Damage to the roots may be by direct physical damage or compaction of

the soil from the weight of plant and machinery or repeated pedestrian movement. This is generally not a problem whilst surfacing is in place as the load is spread and additional protection is not required. However, once the existing surface is removed and the soil below exposed significant damage can occur to the soil structure and directly to the roots in a very short time. The following rules must be followed:

1. No vehicular activity or repeated pedestrian access into the RPAs unless on existing hard surfacing or custom designed ground protection, this must be designed for anticipated loads.
2. Regular vehicle and pedestrian access routes must be protected from compaction by temporary ground protection.
3. RPAs exposed by the works must be protected as set out in BS 5837:2012 until there is no risk of damage from construction activity

Appropriate tools for manually removing debris may include a pneumatic breaker/drill, crow bar, sledgehammer, pick, mattock, shovel, spade, trowel, fork and wheelbarrow. Secateurs and a bow saw must be available to deal with any exposed roots that have to be cut. Machines with a long reach may be used if they can work from outside RPAs or from areas protected by ground protection designed for the loading within the RPA. Debris to be removed from RPAs manually must be moved across existing hard surfacing or temporary ground protection to prevent compaction damage. If possible, leaving below ground structures in place should be considered if their removal may cause excess root disturbance.

1.6. Soft Landscaping

1.6.1. Soft landscaping includes the re-profiling of existing soil levels and covering the soil surface with new plants or an organic covering (mulch). It does not include the construction/installation of solid structures or compacted surfacing. No significant excavation or cultivation, especially by rotovators, should be carried out within the RPAs. Where new designs require levels to be increased to tie in with new structures or the removal of an existing structure has left a void below the surrounding ground level, good quality and relatively permeable top soil should be used for the fill. It should be firmed into place but not over compacted in preparation for turfing or careful shrub planting

Figure 1: Tree Protective fencing

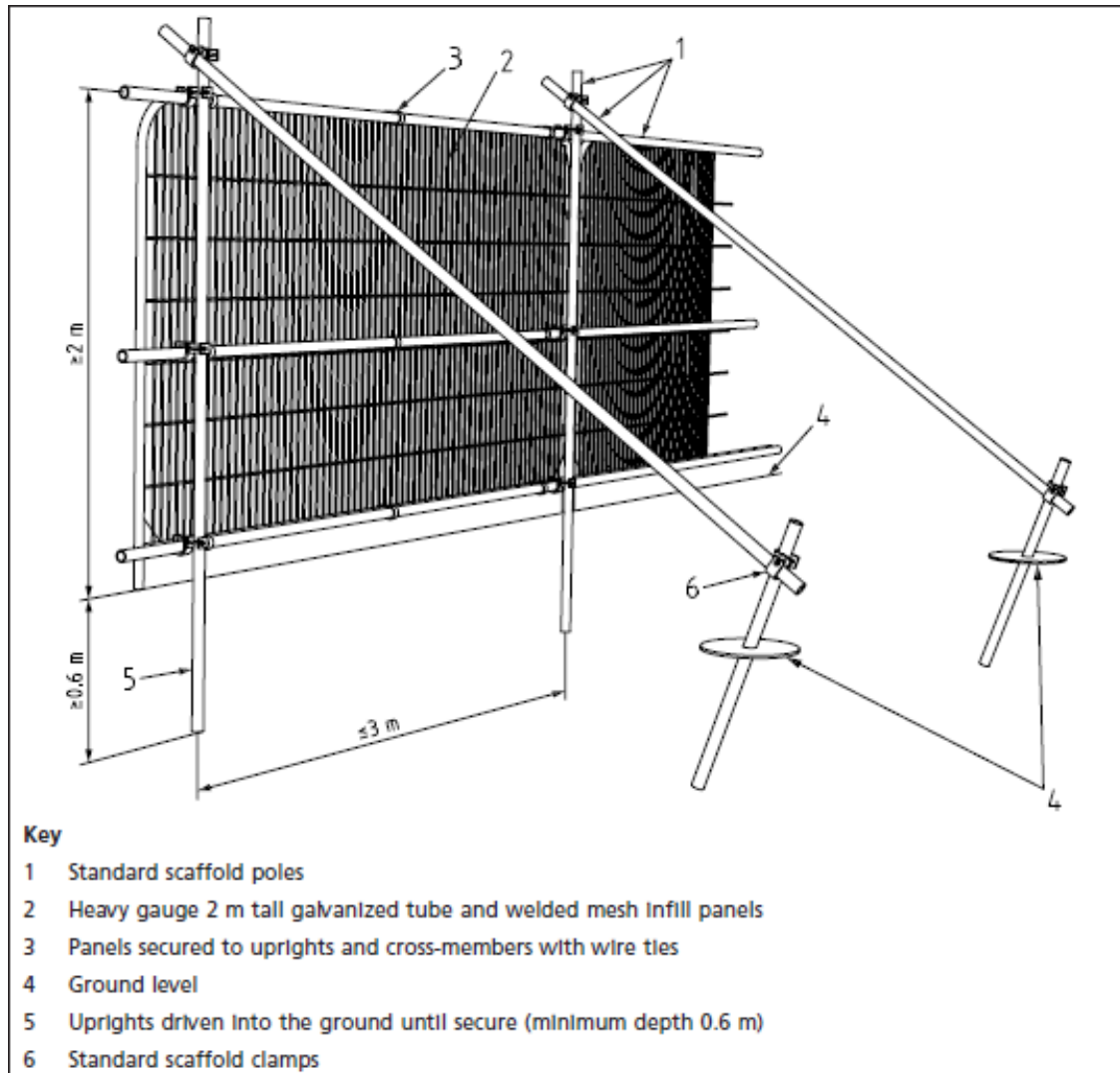


Figure 2: Tree Protective fencing (alternative)

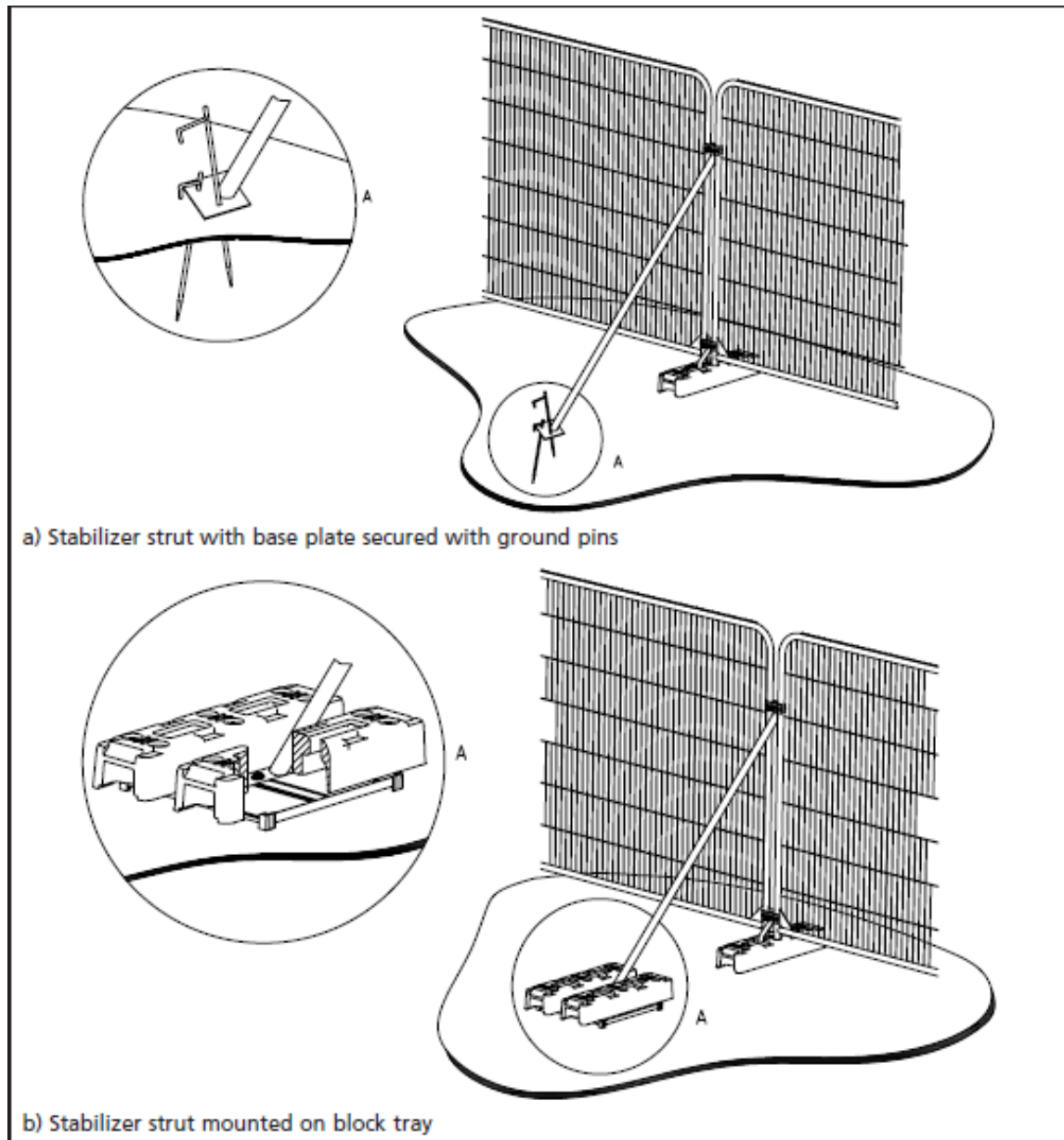


Figure 3: Example of warning notice



Figure 4 Cellular Confinement System



EXAMPLE OF INSTALLATION OF CELLULAR CONFINEMENT SYSTEM



3 WALNUT CLOSE
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KEY

- BS CAT B
- BS CAT C
- ROOT PROTECTION AREA
- SHADE SEGMENT
- TRUNK DIAMETER



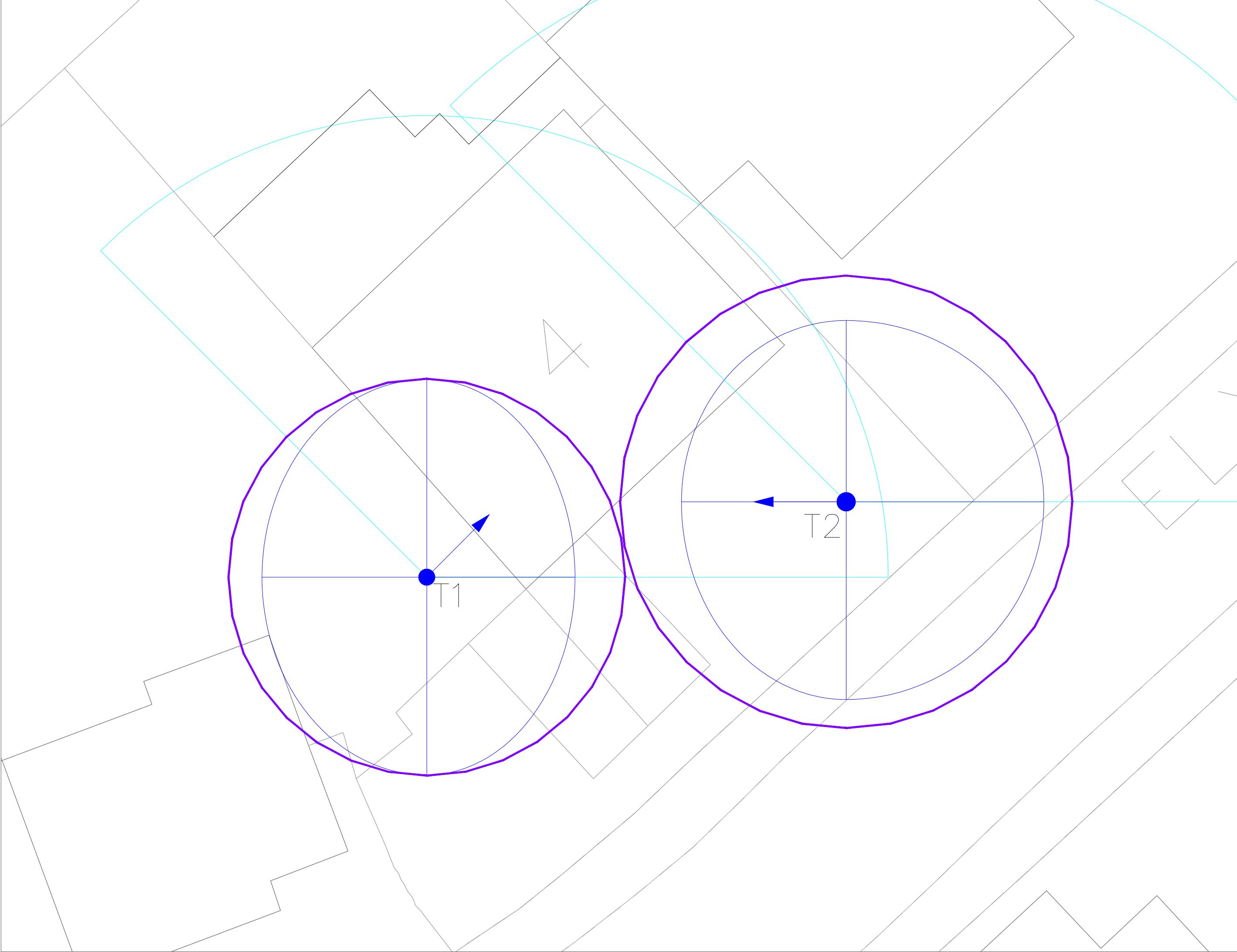
DRAWING TITLE
TREE CONSTRAINTS PLAN
EXISTING SITE

PROJECT
4 ELY PLACE

CLIENT

SCALE	1:100@A3		
DATE OF ISSUE	JUNE 2021		
SURVEYOR	FC	DATE	
DRAWN BY	GMC		
DRAWING No.	TCP_4ELYPLACE_1	REV	A

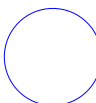
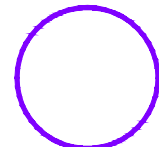


No.		DATE	REVISION





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KEY

-  BS CAT B
-  ROOT PROTECTION AREA
-  PROTECTIVE FENCE TO BS5837:2012
-  GROUND PROTECTION & SPECIAL PRECAUTIONS



DRAWING TITLE
TREE PROTECTION PLAN
PROPOSED SITE

PROJECT
4 ELY PLACE

CLIENT

SCALE	1:100@A3		
DATE OF ISSUE	JULY 2021		
SURVEYOR	FC	DATE	
DRAWN BY	GMC		
DRAWING No.	TPP_4ELYPLACE_2	REV	A

No.		DATE	REVISION

