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Design • Ecology • Arboriculture • Tree Surgery • Groundworks • Landscape Construction • Maintenance

Arboricultural Impact Assessment

To accompany a full planning application

for

Rheola Care Home, Broad Leas, St Ives

on behalf of

Stephen Bradbury Architects



31st July 2022

Philippa Roberts; FdSc, M Arbor A

Our Reference: DFC4039 Rev A

Executive summary

An arboricultural survey has been carried out and this report prepared to support a full planning application to re-develop the site at Rheola Care Home, Broad Leas, St Ives.

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

The purpose of this report is to allow the local planning authority to assess the tree information as part of the planning submission.

There are 8 individual trees, 5 groups of trees and 3 hedges.

- 1 tree have been assessed as high amenity value, Category A
- 1 tree or groups were assessed as being of moderate quality, Category B
- 12 trees or groups have a low amenity value, Category C
- 2 trees are of poor quality and unsuitable for long-term retention, Category U.

The proposal will require the removal of three trees/groups of low value. In addition, two trees of poor quality are proposed for removal, one of which should be removed for health and safety reasons irrespective of development.

The proposed footprint is located outside all root protection areas (RPAs) of trees to be retained, and provides a greater separation than the existing footprint. Some areas of hard surfacing encroach into the RPA of two main trees to be retained, and will need to be constructed utilising ‘no dig’ design.

If the recommendations made within this report are followed, the development should be achievable in arboricultural terms and should be acceptable to the local planning authority.

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1.0 Introduction

1.1 Instruction

DF Clark Contractors have been instructed to produce an Arboricultural Impact Assessment for the proposed development at Rheola Care Home, Broad Leas, St Ives.

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

The development is for the demolition of the existing care home, and construction of a new one.

1.3 Scope and purpose of this report

The purpose of this report is to allow the local planning authority (LPA) to assess the tree information as part of the 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.

Tree roots can be asphyxiated and die if the rooting environment becomes compacted and soil structure damaged, which can easily occur, particularly on clay soils, even with the passage of light vehicles.

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.

1.4 Legal constraints

This site falls under the jurisdiction of Huntingdonshire District Council. There are no Tree Preservation Orders registered on site, but it is located within the St Ives Conservation Area. This means that 6 weeks' notice must be provided to the Local Planning Authority (LPA) before any tree works may be carried out. 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 protection plan in Appendix 5 are based on the proposed layout and change of land use.

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 was undertaken on the 12 April 2022 by Philippa Roberts. The weather was dry, with good visibility.

2.2 Site description

The site is located on the eastern aspect of Broad Leas, and is bounded by residential properties to the north, east and south. The care home building is centrally located, with parking located predominantly to the front and garden areas to the rear. Overall, the site is reasonably level with only very minor level changes.

2.3 The subject trees

There are a total of 8 individual trees, 5 groups and 3 hedges, which are the subject of this report. 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.

No. trees	BS: 5837Category	Category Description
1 tree	A	Life expectancy of at least 40 years, excellent example of species with high amenity value, should be retained.
1 tree	B	Life expectancy of at least 20 years, good example of species but with minor flaws, moderate amenity value and efforts should be made to retain tree.
12 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.
2 trees	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

It is proposed to remove one individual tree, one group of trees and one hedge to facilitate the development. In addition, two trees of poor quality are proposed for removal, one of which should be removed for health and safety reasons irrespective of development.

A new landscaping proposal will accompany the scheme, which will mitigate for tree losses and help to ameliorate the new development.

3.2 Root protection area incursions

There are encroachments within theoretical RPAs of two main trees, which will require specialist construction and/or working methodology. Elsewhere on site existing areas of hard surfacing are proposed to be lifted or renewed and will be subject to the working methodologies set out in Appendix 8 ‘methods working close to trees’.

3.3 Protection of retained trees

Protection measures, usually a combination of barriers and ground protection must be in place before any works, including site clearance, begin, and stay in place for as long as a risk of damage remains. The protection of trees must take account of the buildability of the proposal, including services, and ensure that all activities such as storage of materials, parking and the use of plant and vehicles can be accommodated outside of RPAs. Particular care and planning is necessary in the operation of excavators, lifting machinery and cranes to ensure all vehicle movements and lifting operations will not impact retained trees.

Details of tree protection barriers and ground protection can be found in the preliminary arboricultural method statement section of this report.

3.4 New planting

A landscaping scheme is proposed. Planting locations should be determined at the planning stage and protected during the development to preserve soil structure. The suggested selection of species, size and location are outside the scope of this report.

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 proliferate within soft areas such as grass, shrub beds etc., rather than beneath hard surfaces and structures. The above ground constraints the trees represent by virtue of their size and position 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 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. Trees to be retained have green outlines whilst trees to be removed have red centres and a red, dashed crown spread. Tree protection is shown as barriers and/or ground protection defining the Tree Protection Zone (TPZ)[2] and any areas requiring non-standard methods of demolition or construction are shown in yellow.

[2] *Tree Protection Zone. An area based on the RPA in m^2 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.*

3.7 **Photos**



Photo 1 – T5, willow, looking north



Photo 2 – T5, willow, looking east



Photo 3 – T6, lime, looking west towards Broad Leas



Photo 4 – T9, whitebeam (left), T8, willow (centre) & T7, cherry (right), looking south-west



Photo 5 – G11, 3 x apple, looking south



Photo 6 – T13, walnut, with G15 behind, looking north-east



Photo 7 – G16, 2 x rowan, looking south-west

4.0 Preliminary arboricultural method statement

4.1 Introduction

This section identifies where works with the potential to affect trees require specialised working methods and/or materials. Where sufficient detail of proposals is known, or generic information is applicable, details are included. If insufficient details of proposals are known, a detailed arboricultural method statement (AMS) may be required, or conditioned by the local planning authority, following planning consent. This should be produced at the detailed design stage with the design team. Any operations, including access, within an RPA should be described within the AMS in order to demonstrate that the operations can be undertaken with minimal risk of adverse impact on trees to be retained. This section also includes details of how trees to be retained can be protected throughout the development process. Specific work methodology can be found in Appendix 8.

4.2 Site clearance and set-up

4.2.1 Vegetation/debris/materials clearance. Tree protection barriers and/or ground protection must be in place before site clearance takes place. If necessary, localised vegetation clearance in order to install the barriers can be undertaken using hand tools only (including chainsaws, brushcutters etc.) but without the use of tracked or wheeled plant and machinery.

4.2.2 Temporary site buildings, materials/plant storage, vehicular access and parking. Temporary site cabins, marketing trailers and other site buildings can be used within RPAs if agreed with the LPA. They will need to be installed on appropriate ground protection with no excavation taking place. All temporary services must be installed above ground level

4.2.3 All site storage areas, cement mixing and washing points for equipment and vehicles and fuel storage must be outside RPAs. No discharge of potential contaminants should occur within 10m of a retained tree stem or where there is a risk of run-off into RPAs.

4.3 Tree surgery works

Tree surgery and felling works including stump removal. See Appendix 6 for details. 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.

4.4 **Site investigation and remediation works**

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.

4.5 **Tree protection zone installation using tree barrier protection and/or temporary ground protection**

Barriers must be fit for the purpose of excluding site personnel and machinery. The default specification detailed within Section 6 of BS 5837 should be used unless a different specification has been agreed with the LPA.

In areas where it is not possible to erect protective barriers, ground protection must be used to protect soil structure and roots. This must be fit for purpose and appropriate to the level of pedestrian/vehicular use. See Appendix 7 for details.

4.6 **Excavations including foundations, services, retaining structures, kerbs etc.**

During the design stage every effort must be made to keep all new structures and services outside RPAs. Foundation design that minimises the impact on soil structure and roots is sometimes acceptable. Conventional strip or pile and beam construction is unlikely to be permissible. The use of piles supporting above-ground beams or a raft is more likely to be acceptable. This type of construction results in higher finished levels which can have an impact on finished building heights and level threshold requirements so this must be considered during design. When existing services within RPAs require upgrading or new services have to be installed in RPAs, conventional excavation techniques are usually unacceptable. Trenchless installation should be the preferred option but if that is not feasible, any excavation is likely to have to be carried out by hand or using a compressed air lance under arboricultural supervision.

4.7 Installation of new hard surfacing

Any proposal for new surfacing within RPAs must be able to demonstrate a minimal impact on soil structure and roots and this includes the ability for movement of water and air in and out of the soil. The use of no-dig, cellular confinement systems using porous sub-base and finished surface materials can be acceptable in some circumstances. This has implications for finished levels.

4.8 Use of piling rigs and cranes and other high plant and vehicles

The use of piling rigs, cranes and other high machinery are often used close to trees and it will be necessary to demonstrate this can be achieved without damaging upper parts of retained trees.

4.9 Site hoarding and signs

If site hoarding or signage is to be erected within RPAs it will be necessary to show the design has taken account of retained trees in respect to the positioning of the hoarding/sign and posts, and methodology of installation, such as lining post holes to avoid the caustic effect of wet concrete on tree roots. See Appendix 8.

4.10 New landscaping

Landscape operations have the potential to damage trees if not carried out appropriately; in addition the removal of protective barriers to carry out landscape operations may allow other contractors in previously protected areas.

4.11 Auditable system of arboricultural site monitoring

Monitoring tree protection and supervising any agreed works within RPAs including a schedule of site specific events requiring input of supervision. Report on findings as an audit trail of compliance for the client and local authority (ref. subsection 6.3 of BS 5837).

4.11.1 Pre-commencement site meeting

Before any site works including site clearance begin, a site meeting between the site manager and project arboriculturist 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 project arboriculturist and the developer.

4.11.2 **Site management**

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.

4.11.3 **Site monitoring and supervision**

Once work begins on site, the project arboriculturist 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 this is not an exclusive list:

- tree pruning and felling and site clearance close to trees;
- installation of tree protection barriers;
- installation of ground protection; and
- any agreed works in root protection areas.

The project arboriculturist's role is to monitor compliance with arboricultural conditions and advise on any tree problems that arise or modifications that become necessary. Following every site visit, a 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.

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.

5.0 Conclusions

5.1 Only one individual tree, one small group of trees and a modest hedge are proposed for removal to facilitate the development. These are low quality, C category, trees located internal to the site. The only tree to be removed which is visible from outside the site is T6, and due to poor health and structural condition, this tree needs to be removed on health and safety grounds, irrespective of development.

5.2 The footprint of the new care home is located outside of the RPAs of all trees to be retained, and provides a greater separation than the existing care home.

5.3 New footpaths and a bin/bike store encroach within the RPA of two main trees to be retained. In order to minimise damage to tree roots and soil structure, these should be constructed using ‘no-dig’ design.

5.4 Provided tree protection recommendations and methods of work close to trees outlined in this report are followed, the impact of the development on trees to be retained should be acceptable.

6.0 Recommendations

6.1 During construction, the advice set out within this Arboricultural impact assessment should be followed by all site personnel and supervised at key stages by the project arboriculturist. A copy of it and associated plans should be kept on site and be part of the site induction where applicable. Supervision/monitoring reports to be issued after each inspection as a record of compliance and audit trail for the local authority.

6.2 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.

6.3 Foundation design should take into account trees to be retained, trees to be removed and new trees to be planted.

6.4 Tree protection barriers and any ground protection must be in place before any works begin.

6.5 Ground levels within the RPA of trees to be retained should not be altered. Any contouring requirements should be discussed with the project arboriculturist to minimise the impact upon trees.

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 R-M0915_201, Tower Surveys
- Site plan with hard landscaping, drawing EOS10043-10, by Stephen Bradbury Architects

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 preservations orders: None on site.

The tree protection status is correct at the time of report production, 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 located within the St Ives Conservation Area. There is a legal requirement to provide the LPA 6 weeks' notice of any intended tree works. There are exceptions to this requirement, and it is considered that the condition of T6 falls within these exceptions, however, 5 days written notice must still be provided to the LPA before the works can be carried out.

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 tree which can no longer sustain its mature size, and is starting to retrench (grown down), but may still have a good 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. Ø = average crown radius.

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. 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	Prunus cerasifera (Cherry Plum)	SM	242	6	4(1)	2.5	2	3	2	Fair	10+	C1	2.9	26.42	Multi sremtree but unions obscured by ivy and compost heap. Lean and crown bias to South, due to previous competition. Unremarkable tree of average form and condition.	
T2	Prunus sp.	EM	300	1	4(2.5)	3	3.5	0	1	Dead	<10	U	3.6	40.72	Dead tree	
H3	Ligustrum ovalifolium (Privet)	SM	100	1	2(0)	0.5	0.5	1	0.5	Fair	20+	C2	1.2	4.52	Formally maintained hedge, with some ivy and brambles running through	
H4	Ligustrum ovalifolium (Privet), X Cupressocyparis leylandii (Leyland Cypress)	SM	70	1	1(0)	0.5	0.5	1	0.5	Fair	20+	C2	0.84	2.22	Formally maintained hedge.	
T5	Salix x chrysocoma (Weeping Willow)	M	1190	1	14(1)	7.5	7	11	11	Good	40+	A2	14.28	640.71	Mature tree previously maintained as a pollard, but jas not been pruned in sone time. No evidence of decay around pollard points. Some likely internal decay in main stem but not of any current concern. Some recent storm damage at the top of the tree with a large hanging branch, and another cracked branch above. Some minor deadwood. Branch tipes are making contact with surrounding structures. Tree should probably be repollarded to address remedial issues, although due to its age and the lapse of time since previously pollarded the works should be staggered across a couple of growing seasons to minimise stress to the tree.	Remove large hanging branch on East and remediate storm damage

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
T6	Tilia x europaea (Common Lime)	M	850	1	10(1.5)	4	5	4	3.5	Poor	<10	U	10.2	326.89	Extensive decay in the main rem and root buttresses, with kretczmaria fruiting bodies also present. This fungus is associated with a form of deva which van result in a sudden brittle fracture of the tree. Major deadwood within tne crown. Ivy up stem, tree located immediately adjacent to highway, and should therefore be removed as soon as reasonably possible.	Remove tree, ideally with in the next month, definitely within 3 months
T7	Prunus 'Kanzan' (Japanese Cherry)	EM	290	1	3.5(1.5)	4.5	4	4	4	Fair	20+	C1	3.48	38.05	Japanese cherry. No major defects and reasonable form and condition.	
T8	Salix caprea (Goat Willow)	EM	555	3	5.5(1.5)	5.5	5	6	5.5	Fair	20+	C1	6.66	139.37	Seem divides at 1m, with sound unions. Some minor deadwood otherwise reasonable form and condition.	
T9	Sorbus aria (Whitebeam)	SM	192	2	4(1.5)	3.5	3.5	4	3	Fair	20+	C1	2.3	16.62	Twin stem with tight union but nothing of immediate concern, some lower branch removals. Fairly unremarkable tree of average form and condition.	
G10	Sorbus aucuparia (Rowan), Rhus typhina (Stags Horn Sumach)	SM	200	1	3(1.5)	2	2	2	2	Fair	20+	C1	2.4	18.1	Group of two onsite rhus ad one offsite rowan, located close to the site boundary. Onsite trees are smaller than offsite tree and all dimensions are estimated for the offsite tree. All are heavily ivy clad. Shrubs to the north	
G11	Malus (Apple)	EM	194	2	4(1.5)	2	2	2	2	Fair	20+	C1	2.33	17.06	Group of three apple trees, previously reduced to control size. No major defects but average form ad condition.	

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
G12	Sorbus aucuparia (Rowan)	SM	244	4	4(2)	3.5	4	3	3	Fair	10+	C1	2.93	26.97	Group of two rowans, with some tight unions, minor deadwood and minor cankering. Average form and condtion.	
T13	Juglans regia (Walnut)	M	769	3	9(1.5)	7.5	9.5	10	7	Good	20+	B1	9.23	267.68	Mature tree with some potentially weak unions, but nothing of current concern. Branch tips on the west are making contact with roof of building and should be pruned back to provide clearance. Some relatively minor deadwood, otherwise reasonable condition.	Laterally reduce branch tips on west to provide clearance to roof of building
H14	Ligustrum ovalifolium (Privet)	SM	90	1	2(0)	0.5	0.5	1	0.5	Fair	20+	C2	1.08	3.66	Formally maintained hedge.	
G15	Ilex aquifolium (Holly), Sambucus nigra (Elder), Taxus baccata (Yew)	SM	150	1	3.5(1)	2	2	2	2	Fair	10+	C1	1.8	10.18	Group containing, one holly, one yew and two elder. One elder has partially collapsed, probably under the weight of ivy, holly is also heavily ivy clad.	Remove partially collapsed elder and secret ivy on holly
G16	Sorbus aucuparia (Rowan)	SM	220	1	4.5(1.5)	2.5	2.5	3	2.5	Fair	10+	C1	2.64	21.9	Group of two rowan, with tight unions, but nothing of current concern. Some minor deadwood, average form and condition.	

Appendix 4

Tree survey plan DFC4039 TSP



- **T1 - A** Category A - high quality and value
- **T1 - B** Category B - moderate quality and value
- **T1 - C** Category C - low quality and value
- **T1 - U** Category U - unsuitable for retention

Crown spread

RPA - root protection area as defined by Table 2 BS 5837:2012

Hedge

Group of trees

Revision	Description	Drawn	Date

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Client
Stephen Bradbury Architects

Site address
Rheola Care Home, Broad Leas, St Ives

Drawing title
Tree Survey Plan

Orientation

Date
12.04.2022

Scale
1:300 @ A3

Drawing number
DFC4039_TSP

Revision

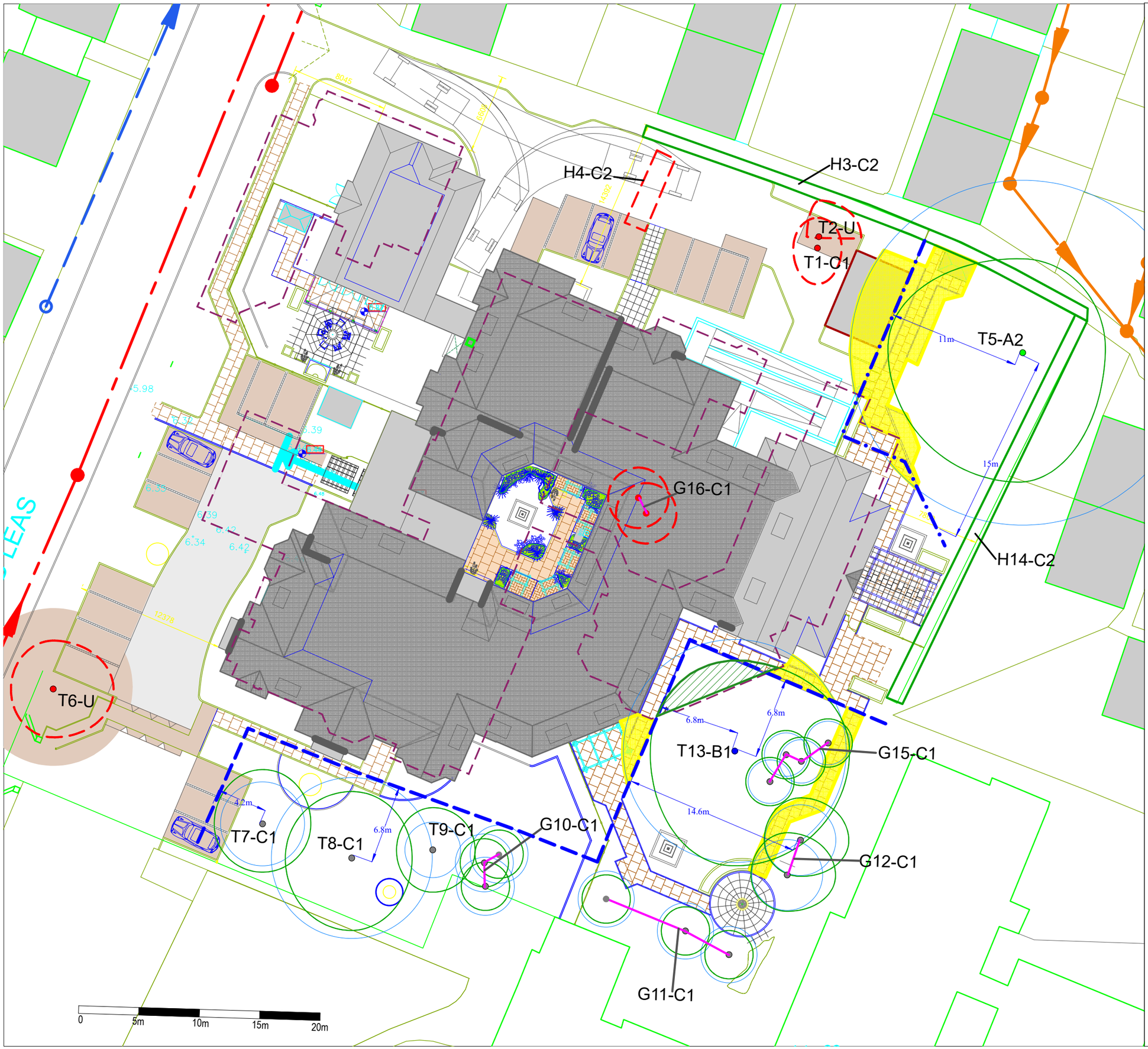
Drawn
PJR

Authorised

Drawing status

Appendix 5

Tree protection plan DFC4039 TPP



T1 - A Category A - high quality and value
T1 - B Category B - moderate quality and value
T1 - C Category C - low quality and value
T1 - U Category U - unsuitable for retention

Crown spread of tree to be retained

RPA - root protection area as defined by Table 2 BS 5837:2012

Group of trees to be retained

Hedge to be retained

Tree to be pruned

Tree to be removed

Group of trees to be removed

Hedge to be removed

Tree protection fencing

Area requiring 'no dig' construction

Outline of existing footprint

Revision	Description	Drawn	Date

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Client
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Site address
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Drawing title
Tree Protection Plan

Date
31.07.2022

Scale
1:300 @ A3

Drawing number
DFC4039_TPP

Revision
A

Drawn
PJR

Authorised

Orientation

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.

Tree no.	**Species**	**Proposed works**	**Reason**
T1	Cherry plum	Remove	Conflicts with parking bay
T2	Prunus sp (dead)	Remove	Unsuitable for long-term retention
H4	Privet, cypress	Remove	Conflicts with turning head
T6	Lime	Remove	Poor structural condition – H & S reasons
T13	Walnut	Laterally reduce north-west crown spread by 2.5m, over existing building	To prevent accidental damage during demolition
G16	2 x rowan	Remove	Conflicts with new building

Appendix 7

Tree protection barriers

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.

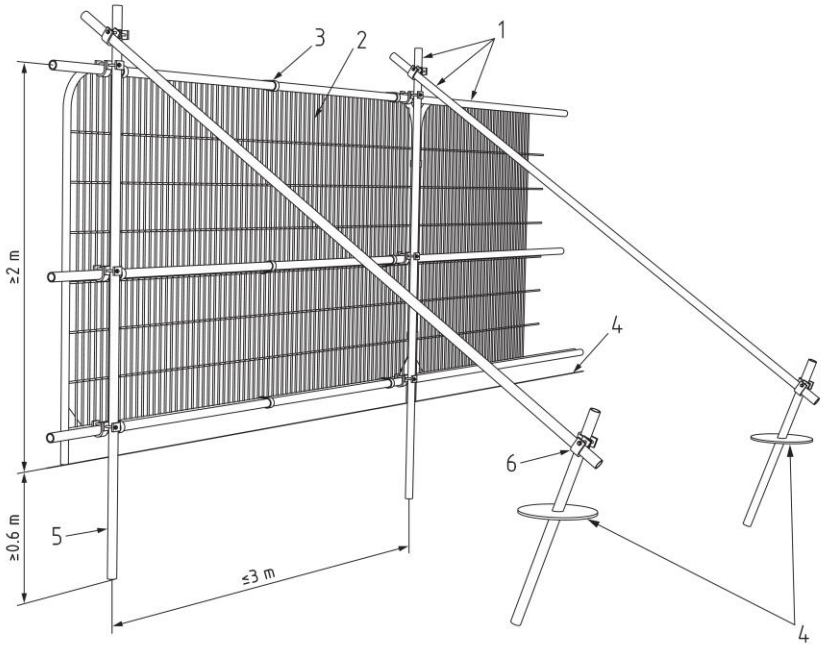
Location: Barriers shall be positioned on the perimeter of the Root Protection Area to define the Tree Protection Zone or as specified in the Tree Protection Plan.

Shown on the Tree Protection Plan by a dashed blue line

Figure 1 Example **of welded mesh barriers in use**



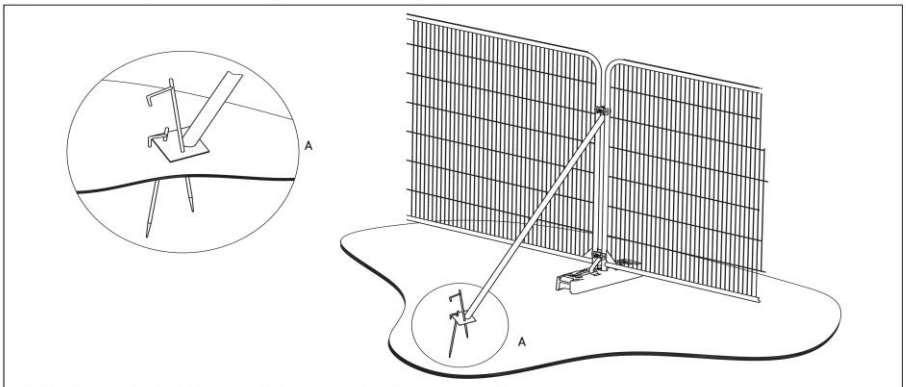
Figure 2 **Default specification for protective barrier**



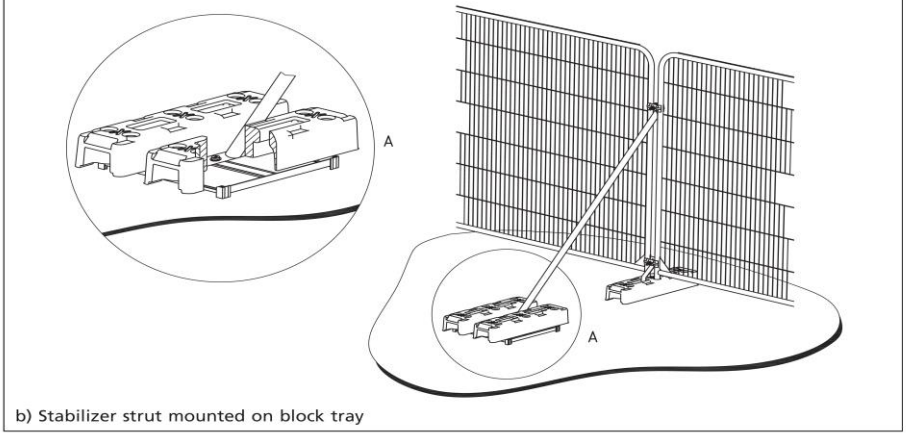
Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Figure 3 **Examples of above-ground stabilizing systems**



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

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; or
- 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
- www.groundtrax.com

Cellular confinement no-dig systems can also be used.

Examples of proprietary ground protection panels





Appendix 8

Methods of work close to trees

Guidance for working within RPAs

This guidance sets out the general principles that must be followed when working in RPAs.

1.0 Removal of hard surfaces within RPAs

1.1 All structures including hard surfaces, walls and fences within tree protection zones (TPZ) must be removed following the methods detailed below to minimise damage to tree roots.

1.2 The use of conventional tracked and wheeled machinery causes damage to soil structure from compaction and damage to roots from excavation and must not be used within the TPZ. All areas of hard surfacing requiring removal within a TPZ will be broken up using a hand held pneumatic drill or mounted hydraulic breaker attached to a digger located outside the TPZ. The broken rubble will then be removed by hand.

1.3 The only exception to this is where the hard surface is of such a size as not to be reachable from outside the TPZ. In this situation a rubber tracked mini-digger will be used. The maximum working height of the machine must be less than the lowest branch of any overhanging trees.

1.4 The mini-digger will work from the existing hard surface pulling the debris away from the tree/s.

1.5 No excavation of existing soil beneath the hard surface will take place.

1.6 Immediately after removal of the hard surface, topsoil or sharp sand must be used to cover the soil surface and any roots to prevent drying out.

1.7 Upon completion, the protective fencing must be moved out to the edge of the TPZ or ground protection used if access is required.

2.0 Demolition of existing buildings and structures

2.1 All structures including hard surfaces, walls and fences within or adjacent to a TPZ must be removed following the methods detailed below to minimise damage to tree roots and upper parts of the tree.

2.2 Protective fencing and ground protection **MUST** be in place before demolition begins.

2.3 Buildings within RPAs must be demolished by pulling inwards, away from the tree.

2.4 Debris fallen within TPZs must be removed by hand.

2.5 Removal of foundations within RPAs must be undertaken from within the footprint of the building, away from the tree, with excavation on the tree side of the foundation kept to the strict minimum required to effect removal. This operation should be supervised by the appointed arboriculturist. If trenches left by removal of foundations are not to be reused as part of the development, they must be backfilled with topsoil suitable for root growth, where within RPAs.

2.6 All removal of fences, sheds, garden structures, low walls etc, must be undertaken by hand where within TPZs.

3.0 Services

3.1 The location and direction of new services should be designed to allow for services to be routed away from the RPAs of retained trees.

3.2 If any services need to run through a TPZ 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.
- Work carefully around roots only cutting as a last resort.
- 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.

4.0 New hard surfaces within RPAs

4.1 Where it has been agreed with the LPA that hard surfaces are acceptable within RPAs of retained trees, these will require designing to be of above ground, no-

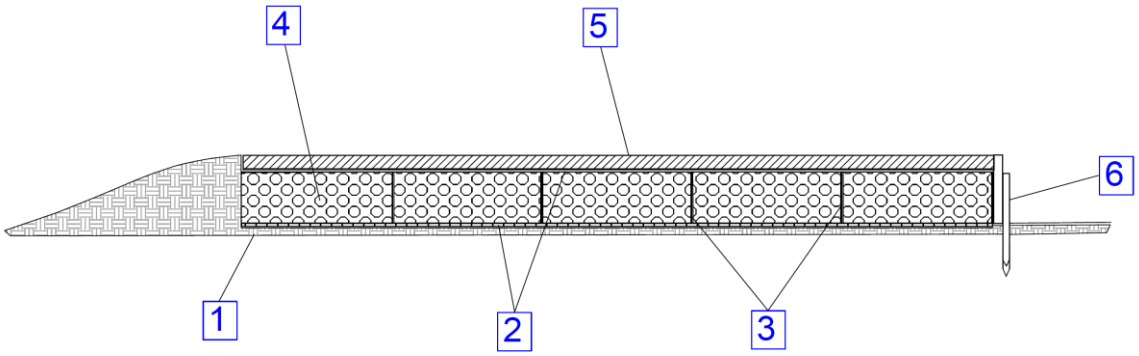
dig construction to minimise impact on tree roots and soil structure. In addition, finished surfaces of the car parking and paved areas will need to be of porous design to allow water and air passage in and out.

4.2 An illustrative example of a cellular confinement no-dig system can be found below. The actual system will need to be designed by a structural engineer to accommodate the loadings anticipated.

4.3 The principles to follow 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.

Example of a Cellular Confinement System



Notes

1. Existing ground
2. Geotextile membrane
3. Cellular confinement system
4. 20/40mm clean angular stone
5. Porous surface layer
6. Timber retaining edge





5.0 Fencing, hoarding, signs etc. within RPAs

5.1 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.

6.0 Landscaping works within RPAs

6.1 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.

6.2 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.

6.3 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.

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

Appendix 9

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

To accompany a full planning application

of

Rheola Care Home, Broad Leas, St Ives

on behalf of

Stephen Bradbury Architects

31st July 2022

Philippa Roberts; FdSc, M Arbor A

Our Reference DFC4039 Rev A

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