

Arboricultural Method Statement

in accordance with
BS 5837:2012 (Item 6.1)

At

Felthorpe

College Road, Caerleon
Newport NP18 3SP

Dated: 12th June 2026

On the instructions of

Ashley Smith
(Business Development Manager)

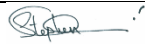
Estuary Oils

Reported by Mr. S J Ambler Cert.Arb.(RFS), Tec.Arbor.A., Dip.Arb.(RFS), F.ARBOR.A.

Of

Ambler-Lewis Tree Specialists Ltd

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Signed - Steve Ambler	
Date	12 th June 2026
Reference Number	26-007

CONTENTS

1.0 INTRODUCTION, SCOPE AND BACKGROUND	3
2.0 TREE PROTECTION PLAN	5
2.1 PLANNING POLICY WALES 12	7
3.0 ARBORICULTURAL METHOD STATEMENT - SITE SPECIFIC MATTERS	11
4.0 TREE FELLING AND SURGERY	11
5.0 BARRIER FENCING	12
6.0 REMOVAL OF EXISTING STRUCTURES AND HARD SURFACES	15
7.0 INSTALLATION OF TEMPORARY GROUND PROTECTION	16
7.1 Installation of Services and Specialised Trenchless Techniques	18
8.0 EXCAVATIONS	19
9.0 INSTALLATION OF NEW HARD SURFACING – MATERIALS AND DESIGN CONSTRAINTS	19
10.0 SPECIALIST FOUNDATIONS	25
10.1 Retaining Structures to Facilitate Changes in Ground Levels	25
11.0 BOUNDARY TREATMENTS FENCING	25
12.0 PREPARATORY WORKS FOR NEW LANDSCAPING	28
13.0 GENERAL MATTERS	31
14.0 AUDITABLE SYSTEM OF ARBORICULTURAL SITE MONITORING	32
14.1 Schedule of Watching Brief Visits	33
15.0 SITE SPECIFIC ARBORICULTURAL EVENTS	33
15.1 Communications List	34
16.0 LEGAL CONSTRAINTS	35
17.0 LIMITATIONS OF THIS REPORT	36
18.0 GLOSSARY OF TERMS	36
19.0 REFERENCES	37
APPENDIX A - DEFAULT SPECIFICATION FOR PROTECTIVE BARRIER	38
APPENDIX B - FIGURE 1 THE DESIGN AND CONSTRUCTION PROCESS AND TREE CARE	39
APPENDIX C - SITE LOCATION PLAN	40
APPENDIX D - TREE PRESERVATION ORDER MAP	41
APPENDIX E - TREE PROTECTION PLAN	42

1.0 INTRODUCTION, SCOPE AND BACKGROUND

Ambler-Lewis Tree Specialist Ltd are instructed by Estuary Oils to undertake an Arboricultural Method Statement for a proposed development on land at Felthorpe, Caerleon, Newport. This Arboricultural Method Statement (AMS) is a requirement imposed by the Local Planning Authority (LPA) as a condition of planning.

This assessment takes account of the previous Tree Survey¹ and the new current layout.

This Arboricultural Method Statement looks at the potential risk of injury to trees from construction activities and advises on techniques and physical barriers to help protect them and their immediate environment. Its purpose is aimed at protecting trees of importance from construction damage and is prepared along the guidelines set out in the relevant British Standard².

The level of detail available is often a limiting factor when developing an AMS, so while a preliminary AMS may be prepared for planning, it is often post-planning when detailed design occurs. Unforeseen issues may arise and therefore, following the iterative approach, further design may be required.

Important notes are highlighted with a grey background, and all Method Statements occur with a light blue background for ease of reference.

NOTE - The most important element in delivering a successful scheme is the engagement of a Project Arborist for the duration of the construction phase and to oversee areas of specific concern. This engagement also maintains a line of communications between all parties and particularly the Local Planning Authority.

Where necessary, recommendations are provided on employing tree friendly construction techniques using acceptable arboricultural practices.

The planning application numbers are - 26/0101 and 26/0342 registered at Newport City Council Planning department.

There is a TPO on site an Oak (*Quercus robur*), designated T29 of TPO 05 of 2016. Refer to TPO Plan in the Appendices.

The following drawings were provided.

- Dwg number (PP) 03A - Existing and proposed site block site plans (Griffiths Design)
- Dwg number 218 200 rev A - Felthorpe Landscape 1 (Steele Landscape Design)

This Consultancy Practice was established by Steve Ambler in 1999. This Report is undertaken by Steve Ambler Cert.Arb.(RFS), Tech.Arbor.A., Dip.Arb.(RFS), F.ARBOR.A., a professional Arboriculturist and Fellow of the Arboricultural Association having over 45 years' experience within the industry and 19 years of which being served in Local Government as a principal arboricultural and woodlands officer.

Steve Ambler holds the relevant qualifications: -

- a) Certificate in Arboriculture (Royal Forestry Society)

¹ Tree Survey, Categorisation and Constraints Report 2026 Felthorpe House Caerleon, (Ambler SJ) January 21st 2026

² British Standard 5837: 2012 Trees in Relation to Design, Demolition and Construction - Recommendations

- b) Professional Technician in Arboriculture (Arboricultural Association)
- c) Professional Diploma in Arboriculture (Royal Forestry Society)
- d) Fellow Member of the Arboricultural Association.
- e) Lantra Award, "Bats and Arboriculture – A Guide for Practitioners" developed by The Bat Conservation Trust.

NOTES.

1. Any alternative construction methods provided here are based on known alternative solutions for tree friendly construction. However, they are suggestions only which should be fully assessed and approved by the Clients Engineer and other appropriate specialists.
2. The reference numbers of the surveyed trees are included in the survey schedule and shown on the Tree Constraints Plan (TCP) in the Appendix which should be read in accordance with this Report.
3. In all cases where tree positions distances may be critical (e.g., in accurately determining clearances between a tree and a proposed structure) all dimensions should be checked on site.
4. The provision and acceptance of this Report are subject to the general terms and conditions of Ambler-Lewis Tree Specialists Ltd

1.1 SITE DESCRIPTION

The site is located centrally in the South Wales historic town of Caerleon, which sits above the Afon Llwyd to the east and Afon Wsyg to the south. It sits at an altitude of approximately 20-40-m above sea level and primarily slopes eastwards. Whilst soil tests have not been undertaken, the area is thought to have free draining and slightly acid loamy soil over primarily sandstone.

A **Tree Preservation Order** provides legal protection for certain trees and groups on site, and these are held in high regard by the Local Planning Authority -

TPO 5 of 2016 was made on the 18th of January 2017 and was confirmed with no objections 27th February 2017 - TPO 5/2016 protects 37 individual trees, a group of 23 trees and a woodland.

NOTE - Where trees have been recorded individually within the Tree Survey there is on occasion some uncertainty as to whether or not they may be included within a protected (TPO) group or woodland. The client is advised to consult with the Local Planning Authority for confirmation when considering trees protected under the Tree Preservation Order. Any felling or remedial works on trees subject to a Tree Preservation Order must have written approval from the Local Planning Authority either through the TPO Works Application process or Full Planning Permission that accepts the recommendations of this Report. The exception are those trees considered to be in a dangerous condition that are deemed exempt under the 'dead, dying or dangerous' clause, whereupon 5 days written notice should be given prior to works commencing.

The site comprises of a diverse age range and species mix of trees, groups, and hedges (both formal and informal) in the following retention categories:-

There was one category A tree recorded on the site.

The majority of category B trees are larger, more prominent specimens in good condition, or groups which have the potential to provide screening of views into or out of the site (or between parts of it).

There are a number of sections where conifers have been planted in rows (two or more) and these need to be carefully considered with regards to the issues relating to light levels and main dwelling rooms within the proposed housing areas. This matter is regulated under the Anti-Social Behaviour Act 2003, Part 8 - High Hedges.

The remaining trees are not considered to be of any particular arboricultural or visual merit; are below the threshold of 75-mm diameter when measured at 1.5 metres above ground level or are in poor condition and have been allocated a retention category of C or U. Due to a history of planting operations on this site there are a number of young trees that fall outside of the criteria set within BS5837, but which could offer long term tree cover if they did not pose significant constraints to the site layout. These younger trees, along with areas of ornamental shrub planting are labelled on the Tree Constraints Plan but are not included within the Findings Table.

A number of stumps were noted, and these are indicated on the attached Tree Constraints Plan.

NOTE- Category C trees are of little merit and need not necessarily be a significant constraint on the site's potential as their loss may be mitigated through planting.

2.0 TREE PROTECTION PLAN

The below ground constraints of any retained tree are equal to its required Root Protection Area (RPA) and this distance for each tree or group is provided within the Tables in both the Tree Constraints Plan and Tree Survey¹ and also reproduced below in Table 1. The distance given is a radial measurement in metres and is provided in the column highlighted yellow. This radial distance must be measured from the centre of the tree's stem.

Table 1.

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N S E W				1st Significant Branch	Canopy Clearance	Life stage	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
20	1383	Downy Birch (<i>Betula pubescens</i>)	16	230	4	3	4	3	4	3	EM	20-40	C 2,3	23	2.70
21	1385	Beech (<i>Fagus sylvatica</i>)	14	230	2	3	2	4	5	4	Y/EM	40+	B 1,3	10	2.70
G10	NA	Lawson Cypress (<i>Cupressus</i>) Felled													
22	1386	Holly (<i>Ilex aquifolium</i>)	10	275	4	5	4	6	4	2	EM/ M	40+	B 2,3	34	3.30
22a	971	Goat Willow (<i>Salix caprea</i>)	10	250	2	3	1	4	3	4	EM	20-	C 2,3		3.00

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N S E W				1st Significant Branch	Canopy Clearance	Life stage	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G11	NA	Goat willow, cherry laurel, Himalayan honeysuckle, hazel Felled													
G12	NA	Yew (<i>Taxus baccata</i>)	2	75	1	1	1	1	0	0	Y	40+	C 2,3	3	0.90
23		Pear Felled													
24	471	Pedunculate oak (<i>Quercus patraea</i>)	15	550	6	9	8	6	3	1	EM	40+	A 2,3	102	9.20
25		Lawson cypress Felled													
G13	NA	Ash, Lawson cypress with juvenile foliage, variegated holly, Wilson's honeysuckle, hazel, holly Ash Felled	11	150	4	4	4	4	2	2	Y/EM	20-40	C 2,3	10	1.80
26		Pear Felled													
27		Holly Felled													
G14	NA	Lawson cypress	14	300 500 large st	5	6	2	4	0	0	EM/ M	20-40	C 2	41	600
28	1392	Red Oak (<i>Quercus rubra</i>)	16	250	1	7	10	5	5	5	EM/ M	40+	C 2	23	3.00
29	1391	Red Oak (<i>Quercus rubra</i>)	16	300	5	7	9	7	4	2	EM/ M	40+	B 2	34	3.60
G15	475	Lawson Cypress (<i>Cupressus</i>)	20	525	9	4	6	7	2	1	M	20-40	B 2	125	6.30
38	1398	Common walnut Felled													

A Tree Protection Plan is provided in Appendix D which is an essential tool providing information for protecting retained trees from injury and damage during construction works – it provides...

- φ The Root Protection Area (RPA) shown as a solid orange line. The radial distance provided is taken from the centre of the tree's main tree.
- φ The correct positioning for installing suitably robust barrier fencing.
- φ A suitable and robust barrier fencing detail as recommended in the British Standard³.

All trees are drawn using a coloured solid line per their retention category -

- φ U - Dark red dashed line,
- φ A - Light green
- φ B - Mid blue
- φ C - Grey

Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, the RPA will be drawn as a polygon. Such modifications to the shape of the RPA will reflect a soundly based arboricultural assessment of likely root distribution.

Proposed new planting is also marked on the plan as a 'constraint', and soil should be protected from compaction with the use of barrier fencing where this is to occur.

2.1 PLANNING POLICY WALES 12

-includes the following key paragraphs in relation to trees: -

Green Infrastructure Assessments

6.2.5 Green Infrastructure Assessments provide key evidence to support the preparation of development plans. Such Green Infrastructure Assessments should use existing datasets, and the best available information, to develop an integrated map-based evidence resource for biodiversity, ecosystem resilience.

6.2.6 Green Infrastructure Assessments should also draw from the evidence base provided by NRW's Area Statements and Nature Network Maps, Wellbeing Assessments and locally and regionally collected green infrastructure data and mapping.

6.2.8 The need for ecosystems, habitats, and species to adapt to climate change and other pressures should be considered as part of the Green Infrastructure Assessment. This must include identifying ways to avoid or reverse the fragmentation of habitats, and to improve habitat connectivity where appropriate, through the promotion of wildlife corridors, protection of riverine corridors and identifying opportunities for land rehabilitation, reducing pollution, landscape management and habitat restoration, creation, and nature recovery.

6.2.9 Planning authorities must encourage the appropriate management of features of the landscape which are of major importance for wild flora and fauna in order to complement and improve the ecological coherence of the National Site Network, formally known as the Natura 2000 network.

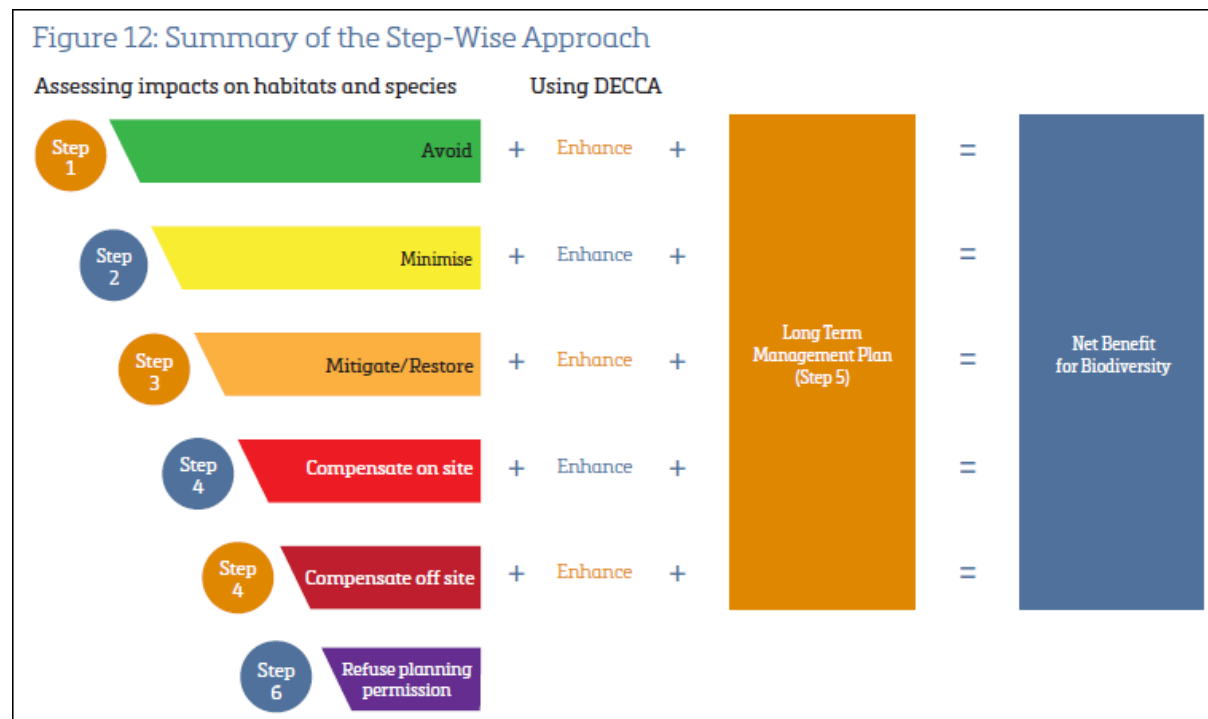
6.2.11 The quality of the built environment should be enhanced by integrating green infrastructure into development through appropriate site selection and use of creative design.

6.2.14 Development proposals should be informed by the priorities identified in green infrastructure assessments and locally based planning guidance. The Building with Nature standards represents good practice and are an effective prompt for developers to improve the quality of their schemes and demonstrate the sustainable management of natural resources.

The Step-Wise Approach

The first priority for planning authorities is to avoid damage to biodiversity in its widest sense (i.e. the variety of species and habitats and their abundance) and ecosystem functioning.

6.4.16 The following factors will affect the implementation of the above stepwise approach: Preapplication surveys, research and data searches by developers will be necessary to establish the baseline state of biodiversity and ecosystem resilience on site taking into account the site's contribution to resilient ecological networks through its diversity, extent, connectivity and condition and the provision of ecosystem services.



6.4.20 Statutorily designated sites must be protected from damage and deterioration, with their important features conserved and enhanced by appropriate management.

6.4.22 It should be recognised that all designated sites will have a unique and important role as part of ensuring resilient ecological networks and this contribution may be equally as important in a local context as its designation status. Distinctive & Natural Places Planning Policy Wales | Edition 12.

6.4.23 Planning authorities should consider opportunities to restore networks of habitats to a healthy condition identified as a result of undertaking the Green Infrastructure Assessment and the identification of appropriate interventions to secure delivery against the attributes of resilience, namely, diversity, extent, connectivity, condition and adaptability.

6.4.24 SSSIs are of national importance. The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000, places a duty on all public bodies, including planning authorities, to take reasonable steps, consistent with the proper exercise of their functions, to further the conservation and enhancement of the features by reason of which a SSSI is of special interest.

6.4.25 Development in a SSSI which is not necessary for the management of the site must be avoided. This is a matter of principle to ensure that these sites can continue to fulfil their role at the heart of resilient ecological networks.

6.4.31 Sites of Importance for Nature Conservation, Local Wildlife Sites, Local Nature Reserves, and Regionally Importance Geodiversity Sites make a vital contribution to delivering an ecological network for biodiversity and resilient ecosystems, and they should be given protection in development plans and the development management process.

6.4.35 The presence of a species protected under European or UK legislation, or under Section 7 of the Environment (Wales) Act 2016 is a material consideration.

6.4.36 Developments are always subject to the legislation covering European protected species regardless of whether or not they are within a designated site.

Trees, Hedgerows and Woodlands

6.4.37 Trees, hedgerows, groups of trees and areas of woodland are of great importance for biodiversity. They are important connecting habitats for resilient ecological networks and make an essential wider contribution to landscape character, culture, heritage and sense of place, air quality, recreation, and local climate moderation. They also play a vital role in tackling the climate emergency by locking up carbon, and can provide shade, shelter and foraging opportunities, wider landscape benefits such as air and diffuse pollution interception, natural flood management, and building materials. The importance of trees, in particular urban trees, in creating distinctive and natural places which deliver health and wellbeing benefits to communities, now and in the future should be promoted as part of plan making and decision taking.

6.4.38 Welsh native tree and hedge species, characteristic of the local area, provide a strong ecosystem resilience function, and they provide resources for local wildlife, particularly other native plants, and species. Native tree and hedge species can also complement opportunities for natural regeneration. Alongside broader woodland habitat types, such as wood pasture, parkland and traditional orchards, native tree and hedge species help to define our cultural heritage and landscape, creating a strong sense of place and connection to the past.

6.4.39 Planning authorities must protect trees, hedgerows, groups of trees and areas of woodland where they have ecological value, contribute to the character or amenity of a particular locality, or perform a beneficial green infrastructure function.

6.4.40 Where trees, woodland and hedgerows are present, their retention, protection and integration should be identified within planning applications. Where surveys identify trees, hedgerows, groups of trees and areas of woodland capable of

making a significant contribution to the area, these trees should be retained and protected. The provision of services and utilities infrastructure to the application site should also avoid the loss of trees, woodlands or hedges and must be considered as part of the development proposal; where such trees are lost, they will be subject to the replacement planting ratios set out below.

6.4.41 Whilst most focus within the planning system is targeted at urban trees, planning authorities should recognise the importance of trees within the countryside, either as woodlands, within hedgerows and hedge banks, or freestanding trees in fields, or as wood pasture.

6.4.42 Permanent removal of trees, woodland and hedgerows will only be permitted where it would achieve significant and clearly defined public benefits. Where individual or groups of trees and hedgerows are removed as part of a proposed scheme, planning authorities must first follow the stepwise approach.

Replacement planting shall be at a ratio equivalent to the quality, environmental and ecological importance of the tree(s) lost and this must be preferably onsite, or immediately adjacent to the site, and at a minimum ratio of at least 3 trees of a similar type and compensatory size planted for every 1 lost. Where a woodland or a shelterbelt area is lost as part of a proposed scheme, the compensation planting must be at a scale, design and species mix reflective of that area lost. In such circumstances, the planting rate must be at a minimum of 1600 trees per hectare for broadleaves, and 2500 trees per hectare for conifers.

6.4.15. Where loss is unavoidable developers will be required to provide compensatory planting (which is proportionate to the proposed loss as identified through an assessment of green infrastructure).

6.4.43 Ancient woodland, seminatural woodlands, individual ancient, veteran and heritage trees and ancient hedgerows are irreplaceable natural resources, and have significant landscape, biodiversity, and cultural value. Such trees, woodlands and hedgerows are to be afforded protection from development which would result in their loss or deterioration unless very exceptionally there are significant and clearly defined public benefits; this protection must prevent potentially damaging operations and their unnecessary loss.

6.4.44 The protection and planting of trees and hedgerows should be delivered, where appropriate, through locally specific strategies and policies, through imposing conditions when granting planning permission, and/or by making Tree Preservation Orders (TPOs).

3.0 ARBORICULTURAL METHOD STATEMENT - SITE SPECIFIC MATTERS

The British Standard promotes the Arboricultural Method Statement (AMS) should be appropriate to the proposals and might typically address some or all the following mentioned below, however this list is by no means exhaustive and additional comments are found.

- a. Tree Felling
- b. Specification for the barrier fencing to enclose the RPA of retained trees.
- c. Location of the barrier fencing to enclose the RPA.
- d. Installation of temporary ground protection.
- e. Demolition of existing structures.
- f. Excavations and the requirement for specialised trenchless techniques.
- g. Installation of new hard surfacing - materials, design constraints and implications for levels.
- h. Specialist foundations - installation techniques and effect on finished floor levels and overall height.
- i. Retaining structures to facilitate changes in ground levels.
- j. Preparatory works for new landscaping.
- k. Auditable/audited system of arboricultural site monitoring, including a schedule of specific site events requiring input or supervision.
- l. Include a list of contact details for the relevant parties.

4.0 TREE FELLING AND SURGERY

The trees for retention and those lost or already felled to this proposal are shown on the Tree, Removal, Retention, and Protection Plan (drawn in red). Recommended work is also given in Table 1 within the 'Preliminary Management Recommendations column of the former survey Tree Survey, Categorisation and Constraints Report 2026 Felthorpe House Caerleon, (Ambler SJ) January 21st 2026 and which is reproduced here -

G12	NA	Yew (<i>Taxus baccata</i>)	Young hedge along roadside boundary. Has potential, but could also be easily replaced through mitigation planting	Prune leaders to promote dense lower growth. Remove adjoining shrubs to improve light levels.
G14	NA	Lawson cypress	Row of conifers close to south boundary. Consider issues in relation to High Hedges Regulations. Condition issues include incipient stem failure, decaying pruning wounds & compression forks. These trees have been poorly reduced 'topped' , at some stage in the past.	Consider removal and replacement with better performing trees more suitable to a development.
21	1385	Beech (<i>Fagus sylvatica</i>)	Tree of reasonable form.	Consider removal of tree 20 to provide space for this tree' s crown to develop
28	1392	Red Oak (<i>Quercus rubra</i>)	Twin stemmed specimen leaning with an asymmetric crown, predisposed to the south and road.	Reduce crown by 3-m distally

Method Statement for Tree Surgery and Felling

1. Engage a Project Arborist (PA) for the duration of works to monitor and advise as necessary under a Watching Brief Scheme.
2. All trees approved for felling (shown on the 'approved' Tree Removal, Retention & Protection Plan) should be clearly marked by the Project Arborist beforehand.
3. PA to provide a toolbox talk to the approved tree contractors
4. PA to supervise tree felling and scrub clearance works and ensure they are in accordance with the approved plans.
5. Development footprint to be marked out clearly on site if required by the Project Arborist.
6. PA to assess the relationship in respect of retained trees and consider any required surgery or felling. Any access facilitation pruning necessary for Enabling Works to prevent injurious contact between plant machinery and the tree(s) should be listed and presented to the LPA for approval. In some cases, working space may be provided by temporarily tying back tree branches. Pruning or tying should be undertaken in accordance with a specification prepared by an arboriculturist.
7. Tree surgery and felling works must follow an approved Tree Works Schedule that is approved by the Local Planning Authority (LPA).
8. All approved tree works should only be undertaken by a competent arboricultural contractor who shall be made known to the LPA in writing 5 days prior to commencement for their approval.
9. Tree felling and surgery should be undertaken with caution to prevent damage to retained trees and particularly their roots underground. Crush injuries will occur to roots of retained trees if felled within their RPA. In such instances, crash-mats should be used.
10. Legal issues relating to tree felling should be observed (Refer to section LEGAL CONSTRAINTS)
11. Under normal circumstances, the 'approved' tree surgery and/or felling works should be completed prior to the erection of the Tree Protective Barrier Fencing although must come within the Watching Brief element under the supervision of the Project Arborist. (Refer to Section 14.0).
12. No vehicles are permitted within the RPA of any retained tree, without the use of load spreading material.
13. Contractors should be made aware of planning conditions relating to trees within and adjacent to the site and of any Tree Preservation Order or other site designation which may be relevant, through providing 'toolbox talks'.

5.0 BARRIER FENCING

All trees to be retained must be protected using robust physical barriers (as shown in the Tree Protection Plan in the Appendix (Ambler) which indicates the correct type of fencing and the location for the positioning of the Tree Protection Barriers. This must be erected before any materials or machinery are brought onto site, demolition, stripping of soil or development of any kind commences, apart from approved³ tree works mentioned above.

Tree Protective Barrier Fencing Method Statement

1. The developer must ensure all Tree Protective Barrier Fencing is installed prior to any occupation of the site and prior to plant, machinery, equipment, site offices or materials etc being located.
2. Engage a Project Arborist for the duration of works to monitor and advise as necessary under a Watching Brief Scheme.

³ Approved by the Local Planning Authority

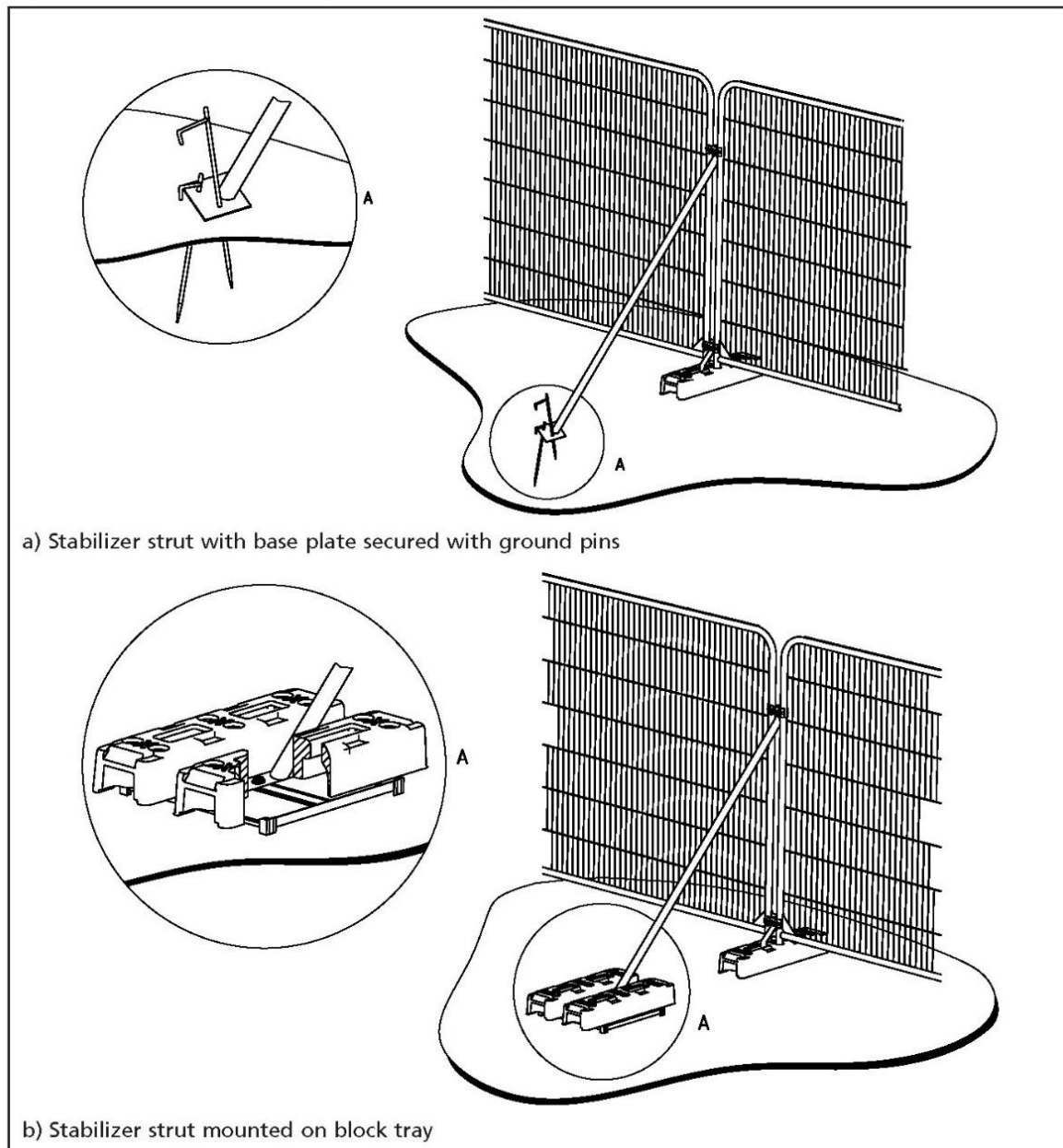
3. Where required, pre-development approved tree work may be undertaken prior to the installation of tree protection measures which must be under the guidance of the PA and with the agreement of the Local Planning Authority. However, no vehicles will be permitted within any unprotected RPA of retained trees and works must be carried out with due consideration and without causing injury to any retained tree. Trees permitted for felling will only be those approved on the Tree, Removal, Retention, & Protection Plan which must be identified on site clearly by the PA.
4. All approved tree felling, and surgery works must be undertaken under the supervision of the PA and ideally completed prior to erection of the tree protective barrier fencing.
5. The PA must identify by marking out the RPA for each tree or group on site, using road pins or fluorescent marker paint.
6. Once the Protective Barrier Fencing is in place, it must protect the Root Protection Area or crown spread whichever the greater and be approved and signed off by the PA prior to any demolition, movement of plant and equipment or any site occupancy.
7. The PA will assess if any trimming or tying back of branches is required to prevent contact injury from plant. The PA will seek approval from the LPA of any Works Schedule created, identifying all necessary works.
8. Barriers should be monitored and maintained throughout the construction phase to ensure they remain rigid, complete, and fit for purpose.
9. Any works occurring within any RPA **must** be covered by an 'Approved' Arboricultural Method Statement and may only proceed under the supervision of the Project Arborist.
10. This protective barrier may only be repositioned or moved where covered by an Approved Method Statement and under the supervision of the PA.
11. It should be confirmed by the PA that the barriers and any necessary ground protection are installed correctly prior to the commencement of any other operation and the LPA informed who may wish to attend site and view it first-hand. A method statement is provided later in this report for installing ground protection measures which must be followed.
12. Prior to any construction activity and where due to site constraints construction activity cannot be fully or permanently excluded from all or part of a tree's RPA, appropriate ground, tree stem, and low crown protection must be installed (see section 6.2.3 – BS 5837), under the guidance of the PA.
13. Here, site circumstances dictate the default level of protection is unnecessary due to existing physical site features. Therefore, an alternative specification is prepared which must be agreed with the Local Planning Authority. The provision of a 2-metre-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 must 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 metre and should be uniform throughout the fence. The panels **MUST** be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 3a). 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 (Figure 3b).

Example of Warning Sign



Figure 3 – Alternative Protective Fencing

Figure 3 Examples of above-ground stabilizing systems



NOTES.

1. It might be feasible on some sites to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without damaging the retained trees or their rooting environment.
2. All-weather notices (Example below) must be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE - NO ACCESS". Refer to example notice below.

6.0 REMOVAL OF EXISTING STRUCTURES AND HARD SURFACES

Demolition

- Demolition of the rear wall of the existing buildings is required - Refer to and follow the Arb method statement below.

Method Statement - Demolition

1. Engage a Project Arborist for the duration of works to monitor and advise as necessary under a Watching Brief Scheme.
2. Any approved tree felling should be undertaken if desired to assist in providing additional room for the demolition process. Trees permitted for felling will only be those with safety issues as mentioned above – Item 4.
3. Approved tree surgery and felling works must be undertaken under the supervision and guidance of the PA.
4. The erection of the Tree Protective Barrier Fencing must be correctly positioned, fit for purpose and approved by the PA prior to any site occupation, the commencement of any construction activities, deliveries, enabling works, including the movement of plant and equipment and commencement of any demolition works.
5. Great care should be taken not to damage the trunk or branch framework of any retained tree. The PA will assess if any stem protection, trimming or tying back of branches is required to prevent contact injury from plant and seek approval from the LPA of a works schedule, identifying all necessary works.
6. All plant and demolition equipment **must** operate outside of the RPA's. If this is not possible, barrier fencing may only be offset to expose some of the RPA providing -
 - it is covered by an approved ³ Arboricultural Method Statement
 - suitable ground protection is installed
 - stems are protected where necessary
 - low branches are tied back or pruned back if part of an approved schedule of works, prior to commencement of operations, all to the satisfaction of the PA/LPA.
7. Some trees stand immediately adjacent to the structure to be removed. In this case, and subject to a risk assessment by the contractor, the demolition should be undertaken inwards within the footprint of the existing building (often referred to as "top down and pull back") to prevent damage to the tree. Barrier Fencing must be in place prior to commencement.
8. The advice of an Arboriculturist should be sought where underground structures are present (none known at this time) within the RPA are, or will become, redundant. In general, it is preferable to leave such structures in situ, as their removal could damage adjacent tree roots.
9. When removing existing hard surfaces above an RPA, the tree protective barrier fencing may be offset temporarily where it is agreed with the PA. All works must be done under the strict supervision of the PA.

10. Plant and equipment should not encounter any part of the tree or unprotected ground surface and where the existing hard surface being removed is not strong enough or of sufficient width to offer support, then load spreading ground plates will be necessary.
11. Demolition and removal of hard surfaces must be undertaken in a way that does not cause soil compaction within an RPA (or an area highlighted for planting) or physically encounter and injure roots or above ground parts of any retained tree.
12. All plant and demolition equipment **must** operate outside of the RPA' s. If this is not possible, barrier fencing may only be offset to expose some of the RPA providing -
 - it is covered by an approved ³ Arboricultural Method Statement
 - suitable ground protection is installed
 - stems are protected where necessary
 - low branches are tied back or pruned back if part of an approved schedule of works, prior to commencement of operations, all to the satisfaction of the PA/LPA.
13. Subject to a risk assessment by the contractor, where possible, the demolition should be undertaken inwards within the footprint of the existing building (often referred to as "top down and pull back") to prevent damage to the trees.
14. Hand-held tools or appropriate machinery should be used (under arboricultural supervision) to remove the existing hard surface, in a reverse working fashion that is not damaging to any part of the tree, working backwards over the area, so that any plant or machinery is not moving over exposed ground.
15. Where any tree stands adjacent to a structure scheduled for demolition, levels of dust are likely to build up on the trees. This can have a damaging effect on the health of a tree where it becomes particularly heavy during the summer months when trees are in full leaf and actively growing. Where this occurs, it should be monitored and removed through hosing down when deemed necessary by the PA.
16. Upon completion of the works, the Tree Protective Barrier Fencing must be reinstated immediately to the satisfaction of the PA and signed off with the LPA.

7.0 INSTALLATION OF TEMPORARY GROUND PROTECTION

- This may or may not be required here and depends on site logistics, where required to protect the RPA of any retained tree, then the following methods must be observed.

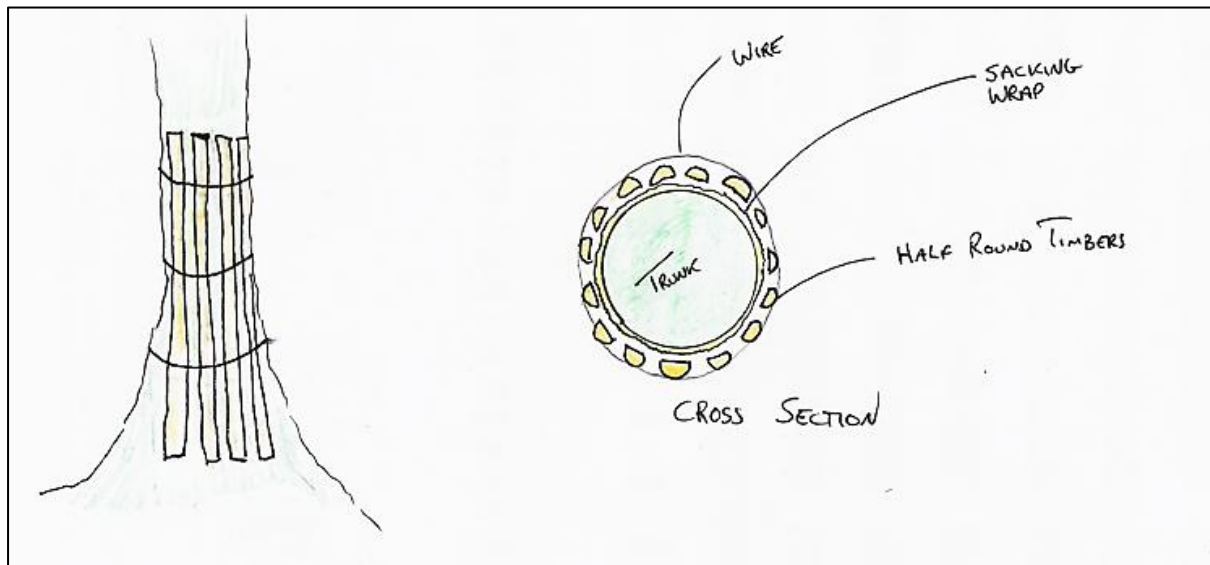
In all cases, the objective should be to avoid compaction of the soil and crushing injuries to the roots which can arise from even a single passage of a heavy vehicle, especially in wet conditions.

Refer to Arb Method Statement below -

Method Statement Ground and Stem Protection

1. A site meeting should be arranged between the Site Manager and the PA to discuss the requirement.
2. Temporary ground protection is to act as a load spreader to avoid soil compaction and compressive root injury.
3. The load spreaders intended for use must be adequate for the loads intended and agreed with the PA in writing prior to commencement of works.
4. Where construction works or temporary access is justified within the RPA, and is highlighted within an approved AMS, this should be facilitated by a set-back in the alignment of the barrier fencing.
5. The Tree Protective Barrier Fencing may be set back the minimum amount required for the duration of the works and to the satisfaction of the PA.
6. Temporary ground protection must be installed over the exposed Root Protection Area (RPA), to act as a load spreader to avoid soil compaction and compressive root injury.
7. Laying the ground protection material over the exposed RPA should be carried out immediately after the set back in the barrier fencing is completed and prior to the onset of any works and preferably during dry weather.
8. Take care not to damage any part of the tree stem or branches. Select plant or equipment that is of a suitable height to prevent the necessity for pruning. Where conflict still exists, tie back branches in preference to pruning where possible or prune in accordance with an approved ³ tree surgery schedule.
9. Install stem protection where necessary in accordance with Figure 1. PA to assess and advise.
10. In all cases, the objective should be to avoid compaction of the soil and crushing injuries to the roots which can arise from even a single passage of a heavy vehicle, plant or equipment, especially in wet conditions.
11. A product such as Trackmats or a similar product should be used which must be agreed with the Project Arborist. The ground protection might comprise of one of the following: -
 - ✓ For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, to form a suspended walkway, or on top of a compression-resistant layer (e.g., 100 mm depth of woodchip), laid onto a geotextile membrane.
 - ✓ For pedestrian-operated plant up to a gross weight of 2-ton gross weight, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g., 150 mm depth of woodchip), laid onto a geotextile membrane.
 - ✓ For wheeled or tracked construction traffic exceeding 2-ton gross weight, an alternative system (e.g., proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with an engineer and Arboriculturist, to accommodate the likely loading to which it will be subjected.
12. Laying the ground protection layers should be done in a forward working fashion to avoid compaction so any vehicle involved in the process will always be situated on top of the ground protection.
13. Removal of the ground protection at the end of the construction phase should also be done in a reverse working fashion.
14. Stem protection should be removed carefully avoiding damage to the bark.
15. Such a set-back in the alignment of fencing must be reinstalled immediately following completion of the works in accordance with the Tree Protection Plan and under the guidance of the PA.
16. PA to sign off the activity with the LPA.

Figure 1



7.1 Installation of Services and Specialised Trenchless Techniques

- The Client informs that no underground or over ground services are to be installed as part of this scheme and existing services will be utilised.

GAS

- None to be installed as part of this scheme

ELECTRICITY

- None to be installed as part of this scheme. Existing supply will be used.

WATER MAINS

- None to be installed as part of this scheme

DRAINAGE, SUDS and SWALES

- To SUDS planters are required and to be located at the rear elevation. They do not conflict with the RPA of any retained tree.

NOTE - New development can influence the existing drainage pattern and ground water levels of a site, due to level changes, increased areas of hard surface and new drainage installations. The root systems of mature trees do not adapt as well as younger specimens to alterations to groundwater. Expert advice on both drainage and trees should be taken where groundwater conditions are liable to change.

SEWER

- None to be installed as part of this scheme. Existing supply will be used.

SIGNAGE AND CCTV

- None to be installed as part of this scheme

VISION SPLAYS

- Trees do not affect vision splays

TOILETS AND SITE ACCOMMODATION

- Toilets and site accommodation will be positioned in the area where the garage is proposed.

CONTRACTORS CARPARKING

- Carparking will be positioned in the area near the location of the garage, outside of RPAs.

SECURE SITE STORAGE

- This will also be positioned in the area where the garage is proposed.

STORAGE FOR SITE MATERIALS

- Storage will be positioned adjacent to the area where the garage is proposed, outside of all RPAs.

8.0 EXCAVATIONS

- On this scheme, no building footprint compromises the RPA of any retained tree.

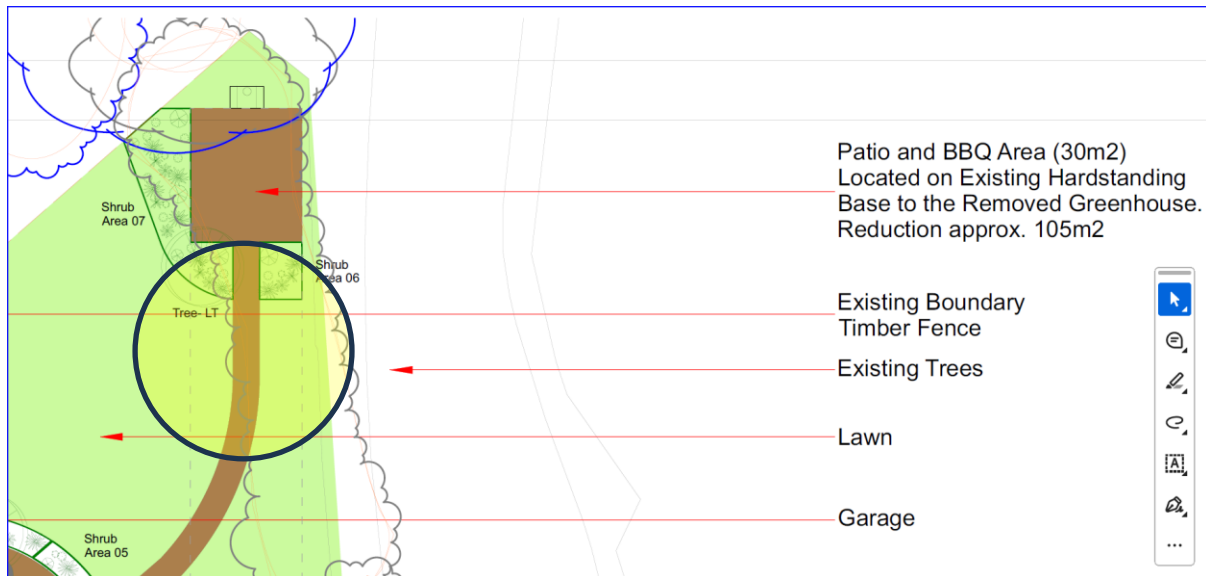
Strip Foundations are equally as damaging and where development footprint conflicts with an RPA, alternative engineering solutions are required. This issue is explored further in Section 10.0.

If roots can be retained and protected in accordance with item 7.2.2 of the relevant British Standard, excavation using hand-held tools might be acceptable for shallow service runs. Such works must be under the supervision of the PA.

9.0 INSTALLATION OF NEW HARD SURFACING – MATERIALS AND DESIGN CONSTRAINTS

- The patio and BBQ area is located on an existing hardstand although the laying of the resin bound footpath access through the RPA's and this can be damaging to trees. The following trees and groups are affected – T20, T21 and Group 14 (G14). Refer to screenshot below. The area is highlighted in the screen shot below, using a dark blue circle with faded yellow fill.
- Tree friendly construction is required where its footprint overlays the RPA of G14. Refer to method statement below.

Screenshot



Tree friendly construction techniques are acceptable providing the existing ground levels are not lowered and the following design principals and working method are engaged. These level changes are significant and should be avoided where possible within the RPA. The following advice is given -

DESIGN RECOMMENDATIONS

1. The design recommendations are taken from ⁴ Arboricultural Practice Note 12 & ⁵Arboricultural Association Guidance Note 12 and should not require excavation or soil stripping into the ground, within the RPA – in other words, NO DIGGING. Scraping is not permitted unless using hand tools to remove turf or vegetation layers.
2. The structure of the hard surface should be designed to avoid localised compaction by evenly distributing the loading over the track width or wheelbase of any vehicle expected to use the access.
3. If the new surface is expected to be subject to de-icing salt application, an impermeable barrier should be incorporated to prevent contamination of the rooting area. Run-off should be directed away from the RPA.
4. Where a permeable surface is to be used by vehicular traffic, a geotextile should be used at the base of construction to help prevent pollution contamination of the rooting area below.
5. Permeable hard surfacing can result in soil volume moisture content remaining at or near field capacity for long periods. Where there is a risk of waterlogging, the design should incorporate appropriate land drainage.
6. Land drainage within the RPA should be designed to avoid damage to the tree and the soil structure, e.g., sand slitting formed by compressed air soil displacement with the slits set radially to the tree.
7. The hard surface should be resistant to or tolerant of deformation by tree roots and should be set back from the stem of the tree and its above-ground root buttressing by a minimum of 500-mm to allow for growth and movement. Resulting gaps may be filled using appropriate inert granular material.

NOTES - Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems. Alternatively, piles, pads or elevated beams can be used to support surfaces to bridge over the RPA or, following

⁴ Arboricultural Practice Note 12. Arboricultural Advisory Information Service. Through the Trees to Development. Derek Patch and Ben Holding

⁵ Arboricultural Association, Guidance Note 12. The Use of Cellular Confinement Systems Near Trees: A Guide To Good Practice. Ben Rose

exploratory investigations to determine location, to provide support within the RPA while allowing the retention of roots greater than 25 mm in diameter.

The use of two-dimensional load suspension systems is not recommended for surfaces intended for use by vehicles.

8. When designing the hard surface, account should be taken of finished levels in relation to adjacent structures, including damp-proof courses, garage slabs and links to existing vehicular crossovers.
9. If a permeable surface is to be used by construction traffic, this should be protected with a temporary sacrificial surface laid over a geotextile separator to ensure that its permeability is retained (i.e., interstices should not become blocked during construction).
10. The excavation needed for the placement of kerbs, edgings, and their associated foundations and haunchings can damage tree roots. Within the RPA, this should be avoided either by the use of alternative methods of edge support or by not using supports at all.

NOTE - For example, where kerbing is required for light structures, such as footpaths, above-ground peg and board edging might be acceptable. Where areas of hard surface require edge support, the use of sleepers (pinned in place where required), gabions or other non-invasive ground-contact structures, including the use of proprietary products, can provide appropriate solutions.

11. The soil structure including the area beneath the proposed new hard surface should be protected from compaction during installation. This may be achieved by a) the use of temporary ground protection to safeguard the working area: b) constructing the new surface with machinery working forward from the surface as it is constructed (known as "rolling out").
12. Where herbicide is used to control vegetation prior to construction of hard surfacing, the manufacturer's guidance should be strictly followed, and care should be taken to avoid any damaging effects on trees or other vegetation to be retained.

NOTE - The use of appropriate geotextiles can provide a barrier that inhibits weed growth but allows water and gases to pass freely.

13. The ground should not be skimmed to establish the new hard surface at the former ground level. Loose organic matter and/or turf should be removed carefully using hand tools. The new surface should then be established above the soil.
14. Raising levels should be achieved by use of a granular material which remains gas- and water-permeable throughout its design life.
15. Due to the highly alkaline leachate produced during the curing of wet concrete, concrete should not be poured within the RPA unless an impermeable liner has been installed.
16. New permanent hard surfacing should not exceed 20% of existing unsurfaced ground within the RPA.
17. Construction should incorporate two main components:
 - A synthetic load spreading material.
 - A no-fines aggregate sub-base.

NOTE - a **geotextile**, which is usually used to prevent layers of different materials mixing while allowing water to pass through, is not designed to be load bearing. 'Load Spreading' materials, are synthetic grids or webs designed to support roads on soft ground by distributing the load of a wheel over a larger area than would normally occur. Such load spreading materials may be two or three dimensional.

18. When placed on a **two-dimensional grid**, appropriate, no-fines granular sub-base material penetrates the mesh, but is unable to pass through it, forming a positive interlock (Figure 4). This interlock between aggregate and grid provides a reinforced platform and efficient load spread into the ground over a wider area than the footprint of the wheel on the surface. A suitable geogrid/aggregate combination constructed with the grid under tension should prevent rutting of the ground beneath construction.

NOTE – two dimensional grids are not to be used where vehicles access is required.

19. The **three-dimensional load spreading products** (Cellular Confinement System) create cells into which the sub-base material is placed (Figure 5 below). Such a construction does support the sub-base material; it confines the material in discrete cells. Manufactures recommended, therefore, that a geotextile (see note above) is placed between the ground and load spreader to prevent the cell-contained mineral material being pressed down on the underlying soil.
20. A no-dig construction above ground level will need to be contained to prevent outward creep under the weight of vehicles. This may be achieved with an edging support provided its construction does not involve excavation. A suitable material may be long-life timbers pinned through the load-spreader into the underlying soil (See Figure 6). This could add strength to the structure because the pressure of vehicles forcing the sub-base downwards and outwards will tend to increase the tension on the grid and tendency to rutting.
21. The granular sub-base material should have a 'no-fines' content which means that even when it is compacted it should be freely draining and will allow oxygen to diffuse into, and damaging gases (e.g., carbon dioxide and methane) out of the soil.

NOTE - For site-specific prescriptions and material specifications, advice should be sought from a qualified geotechnical or civil engineer who should work in consultation with an Arboriculturist.

Figure 4 – Two-Dimensional Load Spreader

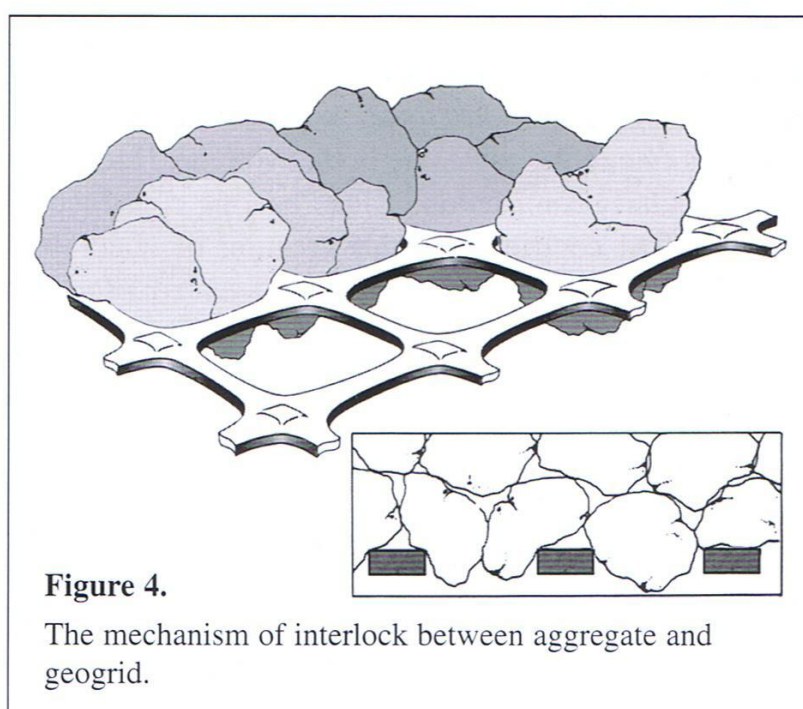
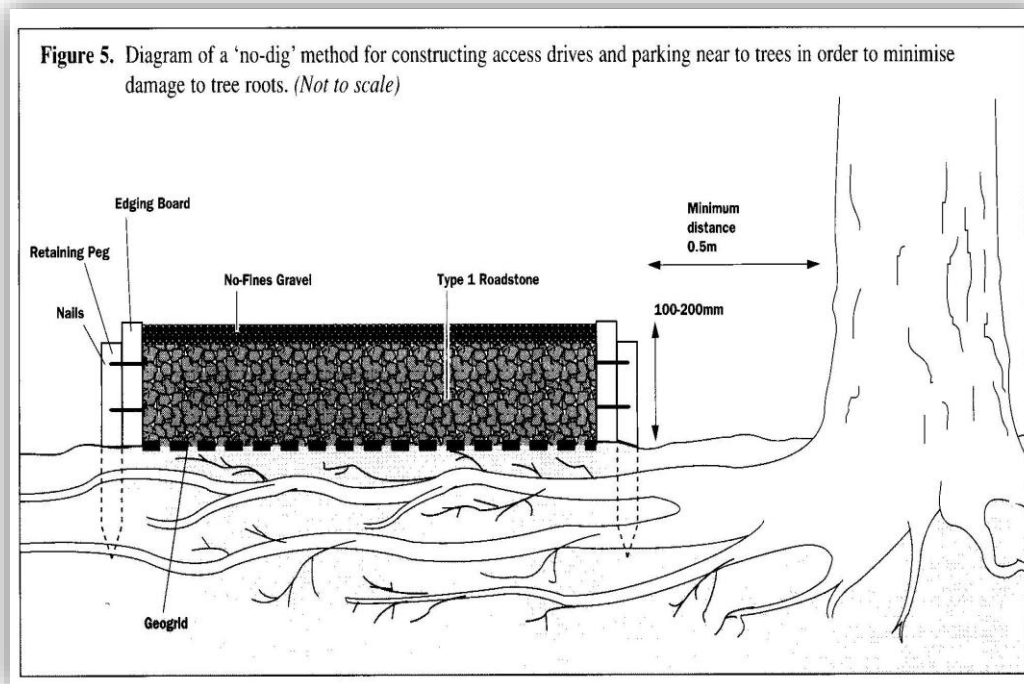


Figure 5 - Three-Dimensional Load-Spreader



Figure 6 – No Dig Method of Construction



Method Statement for Constructing Access within RPA

1. The Client is to mark out the proposed route of the path / road or car park etc. clearly, using flu marker paint or other system, for inspection by the PA prior to any works commencing.
 2. Service route to be located outside the RPA where possible.
 3. PA to supervise the entire operation.
 4. PA to provide toolbox talk to the engaged Contractors undertaking the works immediately prior to commencement of works.
 5. Tree Protective Barrier Fencing to be temporarily offset just sufficiently for the works to be undertaken and immediately prior to the works.
 6. The trees crowns should be protected from possible collision damage and included within the area protected by the tree protective barrier fencing.
 7. Ground plates to be installed where needed, approved and signed off by the PA.
 8. Install stem protection where necessary in accordance with Figure 1. PA to assess and advise.
 9. Any proposed tree surgery works must be scheduled by the PA and presented to the LPA for approval prior to commencement.
 10. Contractor must carry a spill kit and deal with any oil or fuel leaks promptly and report them to the PA and Site Manager.
 11. Construction should ideally be undertaken between May and October when the ground is driest and least prone to compaction.
 12. Take care when constructing not to compact the soil or cause root damage. There **must not** be any movement within the root protection area before the ground is protected by the load spreader and the subbase. Then movement must only be along the construction.
 13. Kill ground vegetation using a translocated herbicide such as glyphosate⁶. After some time, gather up the dead organic material: this will prevent the build-up of anaerobic conditions beneath the construction, which might otherwise occur as vegetation begins to decompose.
 14. Remove major protrusions such as rocks and tree or shrub stumps (stumps should be ground out rather than excavated to minimise soil disturbance).
 15. Fill major hollows with sharp sand. DO NOT GRADE-OFF HIGH SPOTS
 16. If necessary, for example when using three-dimensional cellular confinement products as a 'load spreader', a geotextile should be spread over the area of the driveway or car park.
 17. Lay a geotextile membrane over the whole of the driveway/parking area prior to the application of the three-dimensional load spreader.
 18. Lay the 'synthetic load spreader' directly onto the level ground or the geotextile as appropriate.
 19. Secure the synthetic load spreader under tension using long pins driven into the ground through the grid.
- NOTE-** before driving pegs or pins into the ground, check for underground services that could be damaged.
20. Construct an edging which is secured through the load spreader so that pressure on the running surface will force the edging outwards and so increase the tension on the load spreader. With boards attached to pegs driven into the ground through the geogrid. Pegs should be long enough to give sufficient support for the construction.
- NOTE -** before driving pegs or pins into the ground, check for underground services that could be damaged.
21. Cover the load spreader with a minimum of 100 mm of no-fines aggregate. This should not be tipped straight onto the synthetic material but should be placed at one end and then pushed onto the grid so that machinery moves on the spread sub-base, not directly on the geogrid and not on the ground either side of it. Begin construction at the

⁶ Pesticides can be dangerous...refer to manufactures instructions and follow the advice on the label carefully. Pesticides should only be used by competent personnel.

entrance to the site and 'roll-out' the sub-base in front of the machinery which always remains over the sub-base.

22. Compact the sub-base to ensure binding and to minimise future rutting.
23. A further geotextile may be placed over the sub-base to prevent dry bedding materials or surfacing merging with the sub-base.
24. Place the final surface which is likely to consist of gravel or tarmacadam, although paving slabs and brick pavements may be acceptable, provided they are dry bedded on the sub-base and the joints are not sealed with grout, to allow for infiltration of water and gaseous diffusion.
25. Tree Protective Barrier Fencing to be repositioned in its correct location immediately upon completion of the works and to the satisfaction of the PA.
26. All the works must be to the full satisfaction of the PA.

10.0 SPECIALIST FOUNDATIONS

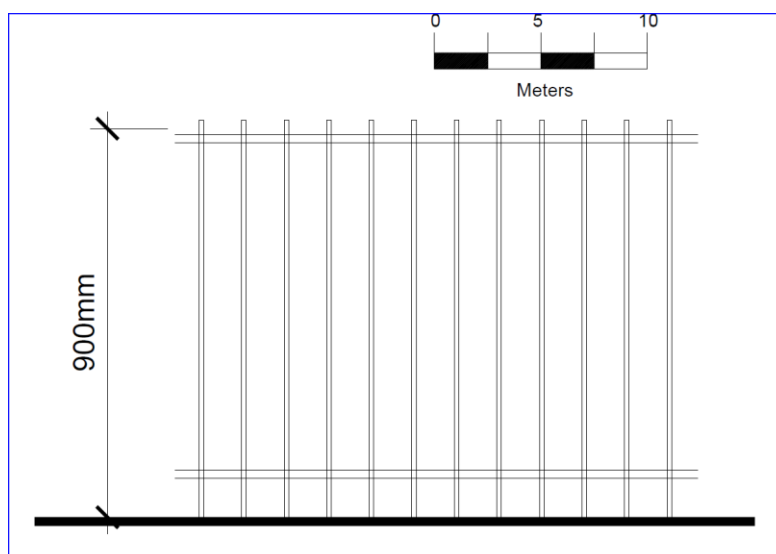
- None required

10.1 Retaining Structures to Facilitate Changes in Ground Levels

- None required

11.0 BOUNDARY TREATMENTS FENCING

- A new 1.2 metre high metal fence is proposed along the southwestern boundary - detailed below. This comprises the RPA of trees T20, T21 and Group 11. See extract below.
- The erection of boundary fencing within RPA has the potential to damage tree roots, their stability, and long-term survivability. Damage may be caused in several ways although the most common is during excavations for the support posts, which can sever structural roots, (the larger, woody roots) that occur within several metres of the tree. To sever these can cause immediate stability and physiological issues and certainly provide entry points for decay organisms which later may become an issue affecting their stability and or long-term survivability.

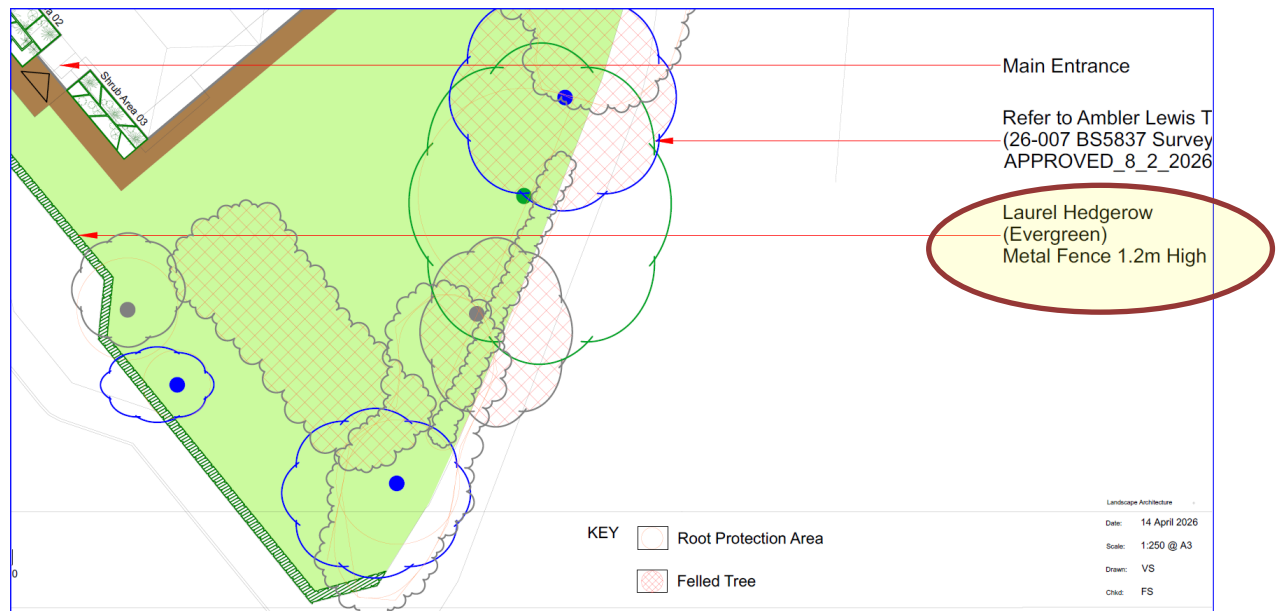


Where possible, excavations should not occur within the Mechanical Effective Root-plate Radius (MERR). The MERR is a radial measurement established during work undertaken by Claus Mattheck⁷ and refers to the critical distances required to maintain the structural roots and stability of a tree. Structural roots differ from the finer feeding roots protected by the somewhat larger RPA. The MERR of any tree directly correlates to its trunk diameter when measured just above the root buttress flare.

Excavations for post holes should not exceed 200-mm in diameter, be cut cleanly with a posthole borer and be carefully positioned. They should not be spaced any closer than 1 metre apart when working within the RPA.

If working in the MERR is unavoidable, it may only proceed using hand tools and under the supervision of the PA and the agreement of the LPA and where the positioning of the fencepost is adjusted to avoid any large roots. These are often visible just along the surface close to the trunk and they should not be damaged during expletory works.

Screen Shot



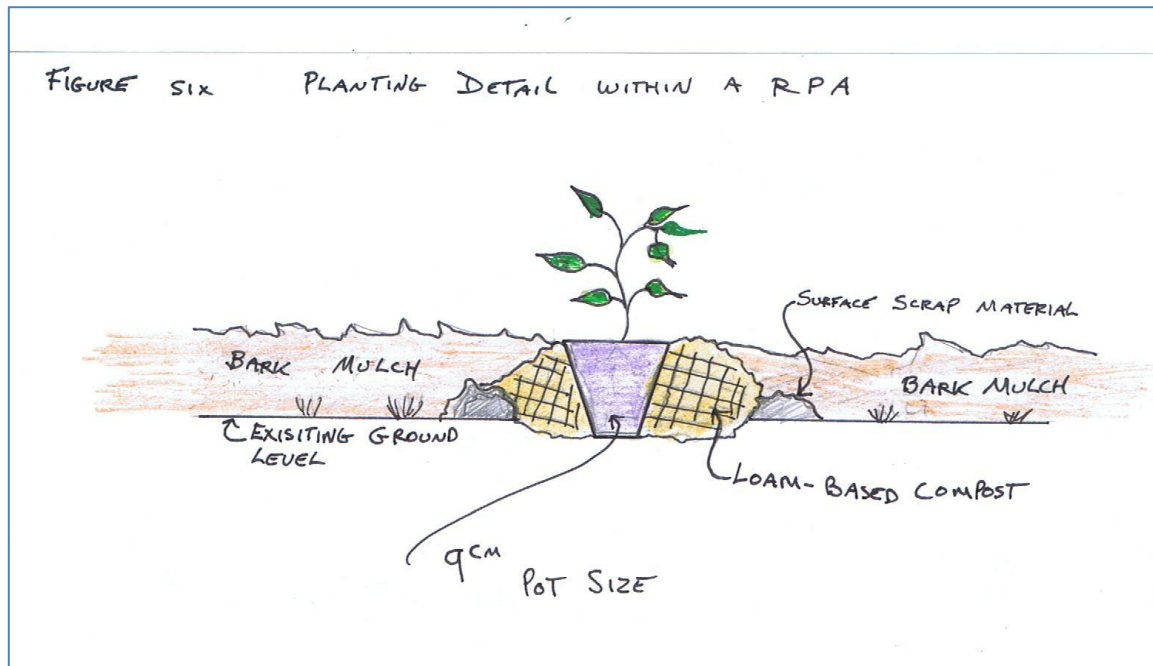
⁷ Mattheck, C. & Breloer, H. The Body Language of Trees. A Handbook for Failure Analysis

Method Statement - Boundary Fencing

1. Excavations should stay outside of the MERR. Site Manager to peg out line of fence for an assessment to be undertaken on site by the PA.
2. A posthole auger will be necessary to cut the postholes, and care should be taken when using any mechanical driven rig within the RPA.
3. Auguring must avoid the Mechanically Effective Root-plate Radius (MERR) of any retained tree, and these distances must be provided by the Arborist whilst on site and clearly marked out.
4. If working in the MERR is unavoidable, it may only proceed using hand tools and under the supervision of the PA and where the positioning of the fencepost is adjusted to avoid any large roots
5. The auger operation should limit the diameter of the holes to 200-mm or below, with a minimum distance between the edge of each pile of 1000-mm.
6. The barrier fencing should be altered to accommodate the works immediately prior to the operation and under the supervision of the PA. Once work is completed, the barrier fencing must be reinstated immediately to each protected tree.
7. Where using a rig, the auger operation should be carried out whilst on top of 'load spreaders' sufficient to support the weight of the plant to protect the RPA from compaction and the underlying roots from compressive injury, this protection should include tracking inwards and outwards from the RPA.
8. Consider the height of the Rig to prevent damage to overhanging branches.
9. Protect the tree stem as shown in Figure 1 where there is a potential conflict.
10. The augured excavated material shall be collected carefully and removed from the RPA.
11. Take precautions to prevent soil contamination, use a non-permeable sheet below the rig during its operation to prevent leaking fuel and hydraulic oil onto the soil.
12. Spill kits should be carried and in the event of any contamination, it shall be collected immediately and disposed of in a proper manner and the Arboriculturalist and Site Manager informed.
13. Where concrete is required, a non-permeable sleeve must be used to each augured hole to prevent leachates entering the soil and great care shall be taken not to spill and contaminate the soil.
14. The Project Arborist shall be informed of the dates of this operation and will attend site and provide a toolbox talk and supervise the work.
15. Works must be carried out to the satisfaction of the PA.
16. Photographic evidence will be taken to update the LPAs Tree Officer as part of the watching brief condition.
17. Upon completion of the works, the Tree Protective Barrier Fencing must be immediately reinstated in compliance with the Tree Protection Plan.
18. PA to sign off the reinstatement of the Tree Protective Barrier Fencing.

12.0 PREPARATORY WORKS FOR NEW LANDSCAPING

- Some landscape planting is proposed within the RPA of trees. This should be avoided as planting into the RPA is damaging to roots. The planting of the Cherry Laurel (*Prunus laurocerasus*) however to the frontage is considered important for screening so with this particular element, and within the RPAs of T20, T21 and Group 11, mound planting is considered acceptable using 9cm pot-grown material. Refer to diagram below.



The RPAs of retained trees should be excluded from landscaping where possible.

Top soiling over and above the root-plate of trees is detrimental to their health even just 100-mm or so and where turf is added.

Laying turf or grass seeding within the RPAs of trees is generally frowned upon and should be avoided. Many LPAs do not allow it, whilst some do. Where it is considered important for turfing or grass seeding within a landscape plan, the following method must be followed: -

Method Statement - Turfing or Grass Seeding

1. All works within the RPA **must** be supervised and recorded by the PA as part of the Watching Brief programme.
2. Tree Protective Barrier Fencing may be temporarily removed or set back during immediately prior to the operations and reinstalled to the satisfaction of the PA immediately following completion.
3. Plant, equipment and vehicles are not permitted within the RA.
4. Ground levels should not be altered.
5. Any existing ground vegetation should be killed using an appropriate herbicide.
6. Dead vegetation may be strimmed, raked or skimmed off using hand tools only.
7. A thin layer (not exceeding 20-mm) of sandy compost may be applied.
8. Seed or turf may be laid directly onto this.
9. All works must be supervised by and to the satisfaction of the PA.

10. Care must be taken to avoid compaction so ideally done during dryish conditions avoiding working on wet and saturated soils.
11. The use of fertilisers is not permitted.
12. Ground must be protected where wheelbarrows or mechanical barrows or small plant is used to prevent ground compaction and working off load spreaders that are suitable to support and distribute the load. Any small plant must be approved by the PA.
13. Precautions must be taken not to damage the tree stem, buttress roots or branches during works.
14. Take the necessary measures to prevent soil compaction.

The general treatment of areas around newly planted and existing trees should allow for adequate infiltration of water and free gas exchange, reduction of water evaporation and the retention of an open soil structure to encourage root growth. Care should be taken to ensure that grass or weed growth does not compete with young root growth by intercepting available water supply. Care should also be taken to avoid the risk of damage to the stems of young trees from future strimming or mowing operations. An area with a radius of at least 500-mm from the stem of newly planted trees should therefore be kept free from competing vegetation by chemical weed control or by the more environmentally friendly option of mulching.

Soil Volumes for Trees

As a rule, the following loamy soil volumes should be provided for newly planted trees. Multiple factors need consideration including climate, size, species, proposed management and soil type.

- Small sized tree (Mature size with a stem diameter of <150mm) = >10m³
- Medium sized tree (Mature size with stem diameter <300mm) = >20m³
- Large sized tree (Mature size with stem diameter >450mm) = >30m³

NOTE - Soft landscape finishes, including mulch and cultivated beds, will generally provide more favourable conditions for young tree establishment than most hard surfaces or grass. The use of ground-cover shrubs with an appropriate organic mulch is particularly beneficial: this treatment suppresses weeds, reduces maintenance, discourages intrusion, and maintains a permeable open soil structure.

Soil Compaction and Remediation Measures.

Soil that has been compacted will not provide suitable conditions for the survival and growth of vegetation, whether existing or new, and is a common cause of post-construction tree loss on development sites. Compacted soil will adversely affect drainage, gas exchange, nutrient uptake, and organic content, and will seriously impede or restrict root growth. The risk of soil compaction is greatest in soils with significant clay content and in wet conditions. It can result from temporary or short-term loadings, such as the passage of a single vehicle, or from longer-term construction activities, including materials storage.

Soil compaction should be avoided in RPAs and areas where new planting or seeding is proposed which contain suitable ground conditions (fertile soil). Where soil compaction has occurred in RPAs or proposed planting areas, arboricultural advice should be taken before carrying out any remedial works. Remedial works may include sub-soil aeration using compressed air, and the addition of other materials, preferably of a bulky, organic nature (but excluding peat), to improve structure.

Use of Mulch.

Open soil and shrub planting areas around newly planted trees should be mulched to inhibit weed growth, reduce groundwater evaporation, resist, and mitigate soil compaction and reduce maintenance requirements, whilst allowing gas exchange and water penetration to roots. The mulch material should be weed-free, easy to apply, containable within the area of application and readily available. The choice of material will be informed by local availability of materials, site characteristics and aesthetic requirements. The mulch should be periodically replenished as it decomposes so that it does not become depleted, and ideally when the soil is warm and moist.

The materials that may be used for mulching include coarsely divided plant matter, such as well-composted wood chip, pulverized bark, leaf mould or green waste conforming to PAS 100, and these may be combined with well-rotted animal manure. If the sole intention is to conserve moisture, a layer of gravel or well-secured sheets of material such as permeable geotextile fabric may be used and may be covered for cosmetic purposes. Any such sheets should be maintained to avoid damage to the tree (e.g., by clogging, weed growth, restriction of air movement or constriction of the stem).

The mulched area should extend over as much of the root system as can be allowed by other site-usage requirements. The depth of organic mulch should not be so much as to inhibit aeration of the root system (normally no more than 100 mm). The area around the tree should be well-watered prior to the application of mulching material and the mulch should be periodically replenished as it decomposes, so that it does not become depleted.

Mulches should be kept away from direct contact with the bark of the stem, or of major roots since this might encourage infection by pathogens by maintaining wet conditions.

NOTES.

1. Mulches that retain water encourage the development of roots near the soil surface and within the mulch itself. This can become a disadvantage owing to desiccation if the mulch is removed or not replenished.
2. Although, by improving the soil texture and acting as a buffer for rainfall, mulches generally help to prevent extremes of soil wetness and dryness, they can prolong waterlogging on sites where drainage is seriously impeded. This in turn can harm tree roots and make them more susceptible to certain pathogens such as *Phytophthora* spp.
3. Further guidance on mulching is given in BS 3998.2010.

13.0 GENERAL MATTERS

To prevent damage to the trees, including their roots, within the fenced area (RPA) there must be no...

- φ Alteration of ground levels, including soil stripping.
- φ Installation of drainage or services using conventional open trenching methods which would not be in accordance with BS:5837. (Any works should be in accordance with the National Joint Utilities NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees Volume 4)
- φ Excavation of any kind.
- φ Storage of any materials or equipment, even on a temporary basis.
- φ Storage of oil, bitumen, cement, or other harmful materials, mixed or discharged within 12-m of the trunk of any retained tree and making further allowances for any slope of the ground so prevent running contamination. Phytotoxic materials would include any mineral oil, fuels, cement mortar washings concrete washings, mortar.
- φ Fires must not be lit beneath or within 12-m of any tree canopies.
- φ Site operations such as deliveries, site machines, crane jibs etc should be organised to avoid damaging the trunk or crown of trees. Where this conflict is unavoidable then facilitation pruning should be carried out in advance, rather than after damage has occurred. This may also be required to allow demolition operations.
- φ Mechanical cultivation of the soil as part of landscaping operations.

Planning of site operations should take sufficient account of wide loads, tall loads and plant with booms, jibs, and counterweights (including drilling rigs), in order that they can operate without encountering the RPA, trunks stems or branches of any retained trees. Such contact can result in serious damage to the trees and might make their safe retention impossible. Consequently, any movement of plant or machinery in proximity to trees should be conducted under the supervision of a banksman, to ensure that adequate clearance from trees is always maintained. Access facilitation pruning should be undertaken where necessary to maintain this clearance if in accordance with good arboricultural practice (see note 2 below).

NOTES.

1. In most instances, local planning authority consent for pruning will be required.
2. Fires on sites must be avoided.
3. Any materials whose accidental spillage would cause damage to a tree should be stored and handled well away from the outer edge of the RPAs.
4. It is both good practice and, in many cases, a regulatory requirement to maintain existing groundwater conditions within, and reduce run-off from, a development site. This can be achieved, for example, using permeable hard surfaces and techniques associated with sustainable urban drainage systems (SUDS). Such techniques can be designed and implemented to benefit both existing and new trees. (SUDS water might need to be treated/filtered and/or tree rooting areas protected from direct contamination in risk areas.)

14.0 AUDITABLE SYSTEM OF ARBORICULTURAL SITE MONITORING

Including a schedule of specific site events requiring input or supervision.

Successfully retaining trees during development depends on several controls being in place. A determination and willingness by all parties is required but primarily the Site Manager will have overall responsibility to ensure that control measures are observed. Communication early in the procedure between the Client, Site Manager, Arborist and Local Authority Tree Officer or other appointed staff is fundamental in maintaining a level of care.

The engagement of a Project Arborist is probably the single most essential component towards ensuring success. This should involve regular 'drop-in' visits by an appointed Arborist who will be responsible for monitoring tree protection measures and offer advice when needed.

A line of communications must be in place between Project Arboriculturist, Site Manager, and Local Planning Authority Tree Officer as a minimum requirement. Details are provided below. Should any queries arise in relation to the protection of trees on this development site then please contact the Arborist on call, during normal office hours.

Such visits must be recorded to form an auditable trail and regular Reports submitted to the Local Planning Authority. The number of visits will be dependent on the type and density of the development and the matters requiring arboricultural input. The number of visits required may also be stated or altered by the LPA at any time during the permitted development.

The Site Manager (SM) must make themselves available for a meeting with the PA during the first Watching Brief (WB) visit. The SM must have read the document prior to the meeting and prepare any questions. During this initial meeting, the PA will point out the Arboricultural Watching Brief system and the site-specific Arb related works section that require specific supervision by the PA, along with the Tree Protection Plan. The SM will be required to sign and date a hard copy of the Arboricultural Method Statement with a dual signature page stating they have fully read, understood, and will implement the recommendations of the document. A copy will be appended to the first Arboricultural Watching Brief report and stay there for future reports, the SM will retain a signed copy on site.

14.1 Schedule of Watching Brief Visits

1. At the very start of the site set up, and prior to the commencement of any construction or movement on site, the Project Arborist (PA) will attend site and provide the Site Manager with a toolbox talk on the Arboricultural Method Statement (AMS), will outline the role of the PA, identify all the key moments and specific arboricultural events within the AMS, and explain the mandatory reporting process to the Local Planning Authority (LPA). Should the Site Manager be replaced or temporarily substituted, then the process must be repeated, and it is the duty of the client to inform the PA when this occurs.
2. The PA should attend site and mark out the Tree Protective Barrier Fencing.
3. The PA should attend site and assess the Tree Protective Barrier Fencing is fit for purpose and sign-off with the LPA.
4. The Project Arborist should attend site and perform a watching brief visit on a weekly basis for the first two months and then fortnightly thereafter unless specified differently by the LPA.
5. The PA at each visit will assess the retained trees and their protection for compliance with the Tree Protection Plan.
6. The PA must supervise all works that occur within or close to any RPA.
7. The suitability of the root protection fencing will be assessed at each visit.
8. Additional visits will occur at scheduled specific events as listed above and the PA MUST receive 7 days' notice in writing of these events so they can be calendared in.
9. Watching Brief Reports will be submitted to the LPA at the end of each month detailing the date of the visit, list concerns, recommended remedial action, sign off remedial action where complete and will include photographic evidence.
10. The Watching Brief Report will relay, communicate and update the LPA of the standard and success of arboricultural care on site.
11. Additional visits should occur at scheduled specific events as mentioned in Item 15.0 below.

15.0 SITE SPECIFIC ARBORICULTURAL EVENTS

1. Tree pruning/felling assessment and schedule of proposed works by the PA
2. The marking out of the RPAs by the PA
3. Erection of Tree Protective Barrier Fencing, PA to check for conformity and sign off with the LPA.
4. The positioning, installation, and suitability of ground protection where necessary.
5. Landscape planting within the RPAs of **T20, T21 and Group 11** within the Special Precautionary Areas (Refer to Tree Protection Plan at rear of Report. Removal of ground protection.
6. Boundary treatment, erecting metal fence within the RPAs of Trees **T20 and T21 and G11**.
7. Footpath construction using no dig solutions.

15.1 Communications List

Mr. Vaughan Lewis (Principal Arborist)
Ambler-Lewis Tree Specialists Ltd
Email - vaughan@steveamblertrees.com
Mobile - 07961322908

Mrs. Richard Baron (Tree Officer)
Newport City Council
Environment & Economy Department
Civic Centre
Newport
NP20 4UR
Email - Richard.baron@newport.gov.uk
Telephone - 01633 232191

Mrs. Paul Kane (Tree Officer)
Newport City Council
Environment & Economy Department
Civic Centre
Newport
NP20 4UR
Email - Paul.Kane@newport.gov.uk
Telephone - 01633 232191

Mr. Scott Ambler (Project Arborist)
Ambler-Lewis Tree Specialists Ltd
Email - scott@steveamblertrees.com
Mobile – 0777 2998 734

Site Manager - To be confirmed.

16.0 LEGAL CONSTRAINTS

Tree Preservation Orders and Conservation Area Status in Wales

In Wales, the law on TPOs is in Part V111 of the Town and Country Planning Act 1990 Town and Country Planning (Trees) Regulations 1999. When any tree/s are protected by a TPO or are situated within a Conservation Area, it is an offence (1) cut down (2) uproot (3) top (4) lop (5) wilfully damage or (6) wilfully destruct a tree without the express written permission from the Local Planning Authority (LPA), there are exceptions. An LPA may grant permission, if considered reasonable following the submission of an application for consent to undertake the works, or where in accordance with an Approved Planning Application or under the exemptions within the Town and Country Planning Act 1990 of dead, dying, or dangerous. It is advisable to consult the LPA and an Arborist prior to conducting any tree works under these exemptions.

Felling License

A Felling Licence may be required in certain felling operations, and these are administered by the Forestry Commission where more than five cubic metres of wood are felled in one calendar quarter and when selling more than two cubic metres. There are exceptions and these are in the Forestry Act 1967 and Regulations made under this Act. Contravention of the felling licence controls can incur substantial penalties. Tree felling forming part of a Local Authority Planning Approval is exempt.

The Wildlife and Countryside Act 1981 protects nesting birds and to disturb nesting birds can be a criminal offence. Therefore, caution must be aired if tree works are programmed during the nesting season, between March and August. Should nesting birds be present then all but essential works will be postponed. If in undertaking essential works a nest or nests are found to be present, then further advice will be sought from the Countryside Council for Wales.

Bats...Summary of Current Relevant Legislation

There are some 17 species of bat which are known to breed in the British Isles, all are insectivorous and depend to some extent on habitat in which trees are a significant element. Bats are a protected species and are in decline both globally and nationally. Therefore, they are to be fully considered before any tree work commences and particularly if the trees are mature. If a bat roost is known to be in any tree that is to be removed or worked on, a license must be obtained from the Welsh Assembly Government beforehand.

The European Habitats Directive (passed in 1992) provides the principal legal protection for bats in the UK, and this is currently enacted into British legislation through the Conservation of Habitats and Species Regulations 2010 in England and Wales: The Conservation (Natural Habitats &c) Amendment (No. 2) (Scotland) Regulations 2009 in Scotland: and the Conservation (Natural Habitats &c) Regulations (Northern Ireland) 1995 (as amended) in Northern Ireland. These regulations relate to all animals which are identified as European Protected Species (EPS) which includes all bat species.

The different countries of the UK have domestic legislation which also provides protection (by varying degrees) to bats however, this has been superseded by the Regulations specified above.

Under the Regulations it is illegal to:

- kill, injure or capture a bat
- disturb bats
- damage or destroy a bat's breeding site or resting place (roost)
- possess a bat (live or dead) or offer one for sale or exchange.

This is a simplified summary of the legal position relating to bats and is intended for guidance purposes only. If further assistance is required, the primary legislation should be referred to or legal advice sought.

The legislation makes it an offence to intentionally or recklessly damage, destroy or obstruct access to a site used by bats whether bats are present at the time or not. This can include work on trees whether it is surgery, felling, the covering, or filling of cavities or the installation of rod braces and flexible cable braces, where a bat roost is present.

Where there is a risk bat roosts may be present, it is incumbent upon the owner or manager to commission a specialist bat survey to identify bat roosts before instructing tree surgery to commence. Failure to do so and in the event of disturbing a roost site or injuring any bats is an offence. Maximum penalties for committing offences relating to bats or their roosts can amount to imprisonment for a term not exceeding six months or to fines of up to Level 5 on the standard scale under the Criminal Justice Act 1982/ 1991 (i.e., £5000 in April 2001) per roost or bat disturbed or killed, or to both.

Statute and Common Law.

A landowner or land manager should be aware that both statute and common law dictates regular inspections of trees on land in their control are necessary where such trees could cause injury or damage in the event they should fall or shed any parts. A person suitably qualified in arboriculture should undertake such routine inspections and any remedial tree works recommended should be carried out within the time constraints specified, to prevent injury or damage occurring. A landowner should retain records of all inspections and any remedial tree works that have resulted from such inspections. Arboricultural Association, the Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire, GL10 3DL. Telephone 01242 522152. www.trees.org.uk are able to provide advice on suitably qualified persons or indeed suitable qualifications a person should hold to undertake qualified inspections.

17.0 LIMITATIONS OF THIS REPORT

It must be stressed that this report is a desktop, pre-development assessment and not a risk assessment or a detailed report on the health and condition of the trees. Tree/s should be subject to regular tree condition inspections and a full tree condition inspection and appropriate management appraisal is strongly recommended and particularly on completion of any development.

The effect this new development may have on localised wind turbulence has not been assessed during this inspection. As trees grow, they respond and mechanically adapt to their surroundings and exposure limits. With the erection of dwellings in close proximity to existing trees, new turbulence is created. The author accepts no liabilities to any failure subsequent upon such new imposed, artificial conditions.

Unless stated in writing, the inspection shall not include any underground parts of the tree. It does not consider **indirect** damage resulting from the extraction of moisture from shrinkable clay soils by tree roots causing **subsidence** or by **heave** occurring through soil rewetting following removal of trees on this site. Such problems are almost entirely restricted to areas of shrinkable clay soils and as I have **not** considered a soil analysis as part of my present brief, this aspect is **not** addressed at this time.

Unless otherwise stated in writing and in the absence of altered circumstances, a report on the health and safety of a tree or trees cannot be relied on after a period of 12 months. Following such a period, a further inspection is required.

Further and more general report limitations are set out in the authors Terms and Conditions and copies are available upon request.

18.0 GLOSSARY OF TERMS

Anchorage: in trees, the holding of the root system within the soil, involving the flow of forces from the stem through the branches of the root system to the cohesive root/soil interface.

Assessment: in relation to tree hazards, the process of estimating the risk which a tree or group of trees poses to persons or property (THIS INVOLVES A VISUAL INSPECTION FOR DEFECTS AND CONTRIBUTORY SITE FACTORS, AND SOMETIMES ALSO A DETAILED INVESTIGATION OF SUSPECTED DEFECTS)

Assym: This abbreviation means...asymmetric...and refers to the tree having an asymmetric or unbalanced crown. This is usually preceded by a measurement in metres which provides the extent of crown asymmetry and is measured from the centre of the trunk. It may also have a correlation to the lever arm.

Arboriculturist: person who has, through relevant education, training, and experience, gained recognised qualifications and expertise in the management of trees generally and in relation to construction.

Architecture: in a tree, a term describing the pattern of branching of the crown or root system.

Arboricultural Implication Assessment (AIA) study, undertaken by an Arboriculturist, to identify, evaluate and possibly mitigate the extent of direct and indirect impact on existing trees that may arise as a result of the implementation of the site layout.

Arboricultural Method Statement: methodology for the implementation of any aspects of development that has the potential to result in loss of or damage to a tree.

Assessment: in relation to tree hazards, the process of estimating the risk which a tree or group of trees poses to persons or property (THIS INVOLVES A VISUAL INSPECTION FOR DEFECTS AND CONTRIBUTORY SITE FACTORS, AND SOMETIMES ALSO A DETAILED INVESTIGATION OF SUSPECTED DEFECTS)

Bole (trunk): the main stem of a tree below its first major branch

Branch: a limb extending from the main stem or parent branch of a tree

Canopy: the topmost layer of twigs and foliage in a woodland, tree, or group of trees

Construction Exclusion Zone: area based on the RPA (meters as a radial measurement and sometimes a m²), identified by an Arboriculturist, to be protected during development, including demolition and construction work, by use of barriers and/or ground protection fit for the purpose to ensure the successful long-term retention of a tree.

Crown: in arboriculture the main foliage-bearing portion of a tree containing the leaves and branches

Heave: in relation to a shrinkable clay soil, expansion due to re-wetting, sometimes after the felling or root severance of a tree which was previously extracting moisture from the deeper layers: also, in relation to root growth, the lifting of pavements and other structures by radial expansion: also, in relation to tree stability, the lifting of one side of a wind-rocked root plate.

Pruning: the removal or cutting back of twigs, branches, or roots: in some contexts, applying only to twigs or small branches only, but more often used to describe all kinds of work involving cutting.

Retained Tree: a tree that has been considered suitable by an Arborist for retention and which during the design stage is selected for retention and incorporated within the development.

Risk: the likelihood of the potential harm from a particular hazard becoming actual harm.

Root Protection Area (RPA): layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree, shown in plan form in m²

Soil heave: see heave.

Subsidence: in relation to soil or structures resting in or on soil, a sinking due to shrinkage when clay soils dry out, sometimes due to extraction of moisture by tree roots.

Subsidence: in relation to branches of trees, a term that can be used to describe a progressive downward bending due to increasing weight.

Tree: a woody plant, which typically has a single main stem and, in maturity, attains a height of at least four metres and a stem diameter at breast height of at least 75-mm.

Tree Constraint Plan (TCP): plan prepared by an Arboriculturist for the purpose of layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have on layouts through shade dominance, etc.

Tree Preservation Order: in Great Britain, an order made by a local authority, whereby the authority's consent is generally required for the cutting down, topping or lopping of specified trees.

Tree Protection Plan: scale drawing prepared by an Arboriculturist showing the final layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement (AMS), which can be shown graphically.

Trunk: the single main stem of a tree.

Visual Tree Assessment (VTA): in addition to the literal meaning, a system expounded by Mattheck & Breloer (1995) to aid the diagnosis of potential defects through visual signs and the application of mechanical criteria.

19.0 REFERENCES

British Standards Institute Publication 'Trees in Relation to Design, Demolition and Construction – Recommendations' 2012

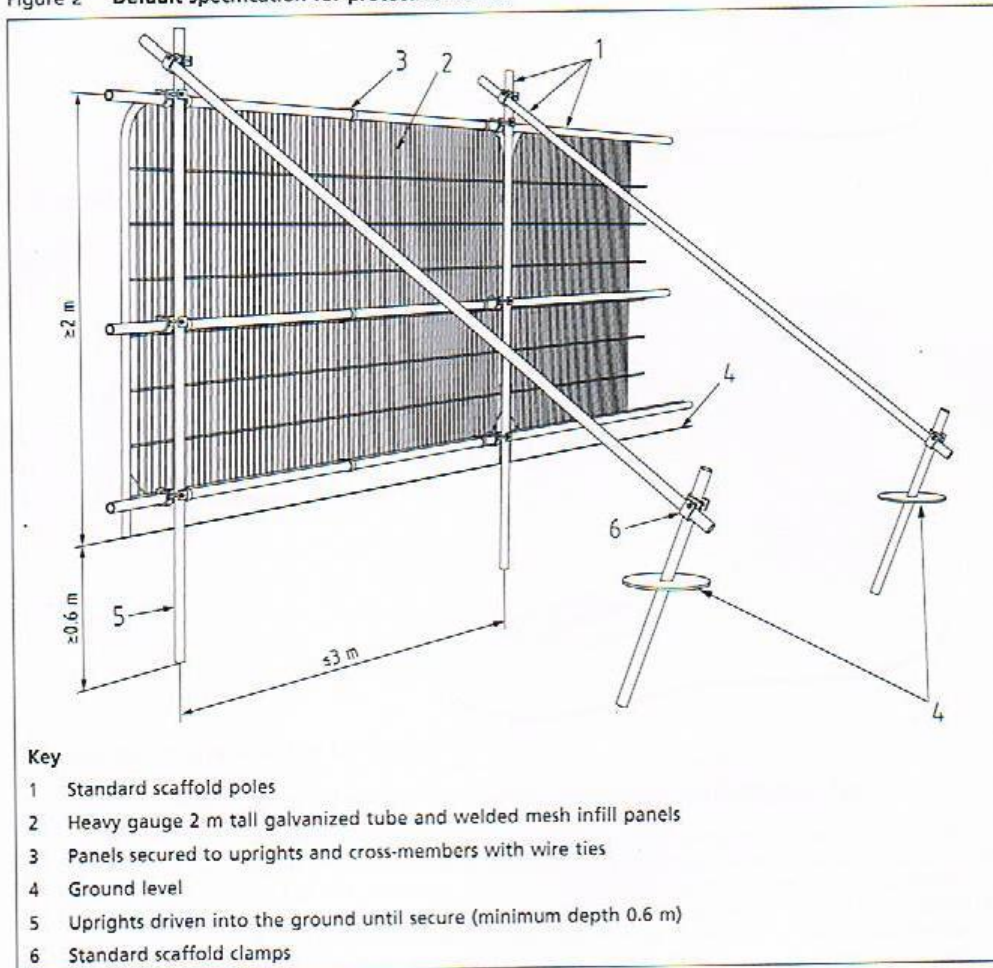
British Standard Recommendations for Tree Work BS 3998: 2010

Tree Survey, Categorisation and Constraints Plan (Ambler-Lewis)

Tree Protection Plan (Ambler-Lewis)

APPENDIX A - DEFAULT SPECIFICATION FOR PROTECTIVE BARRIER

Figure 2 Default specification for protective barrier

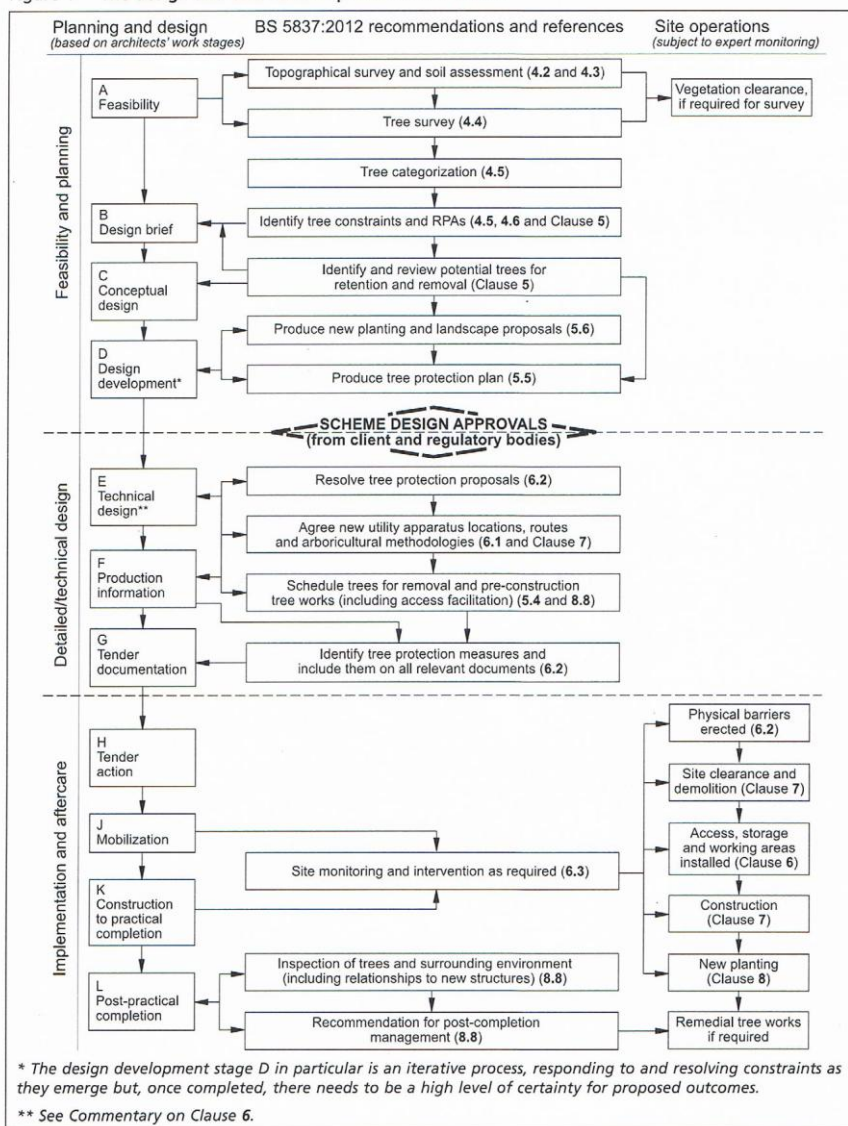


APPENDIX B - FIGURE 1 THE DESIGN AND CONSTRUCTION PROCESS AND TREE CARE

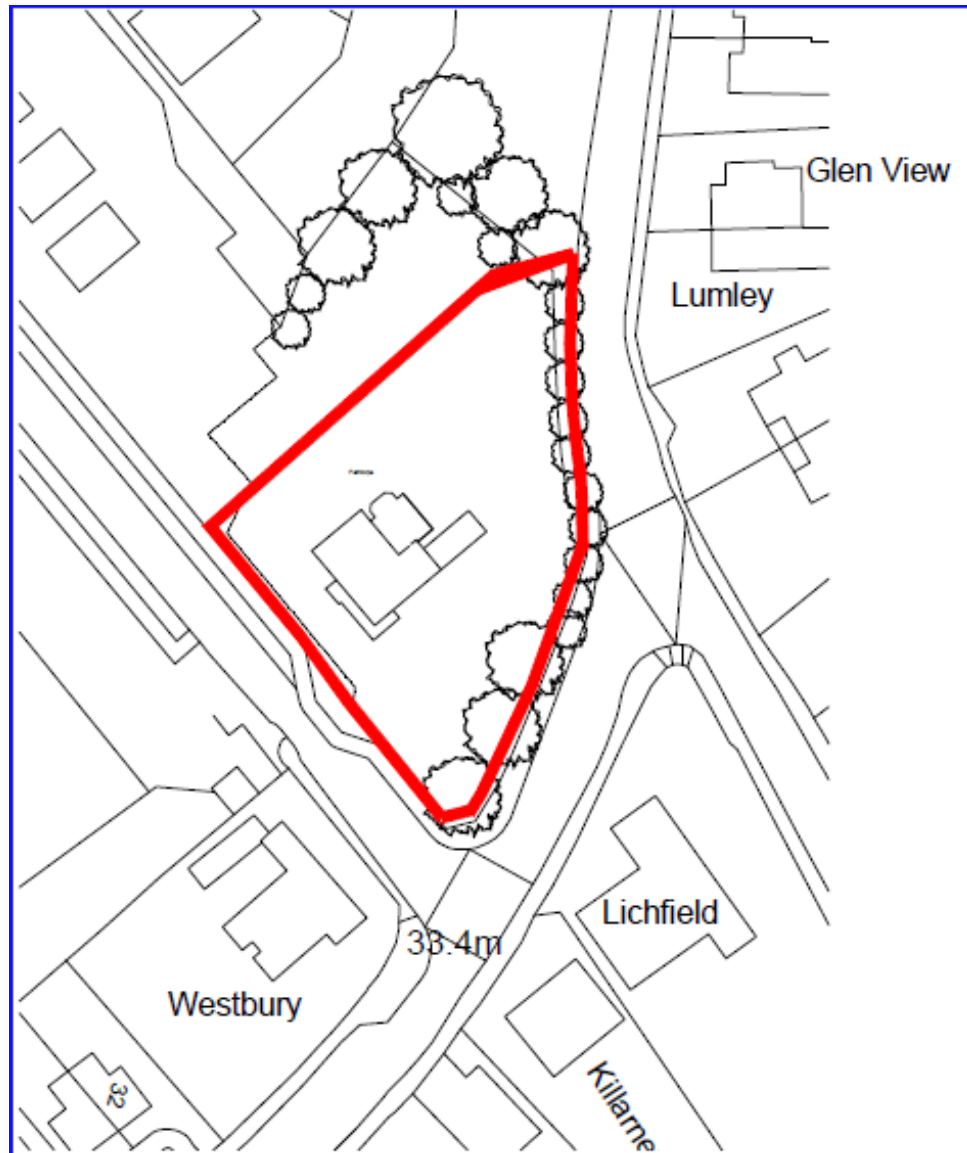
BS 5837:2012

BRITISH STANDARD

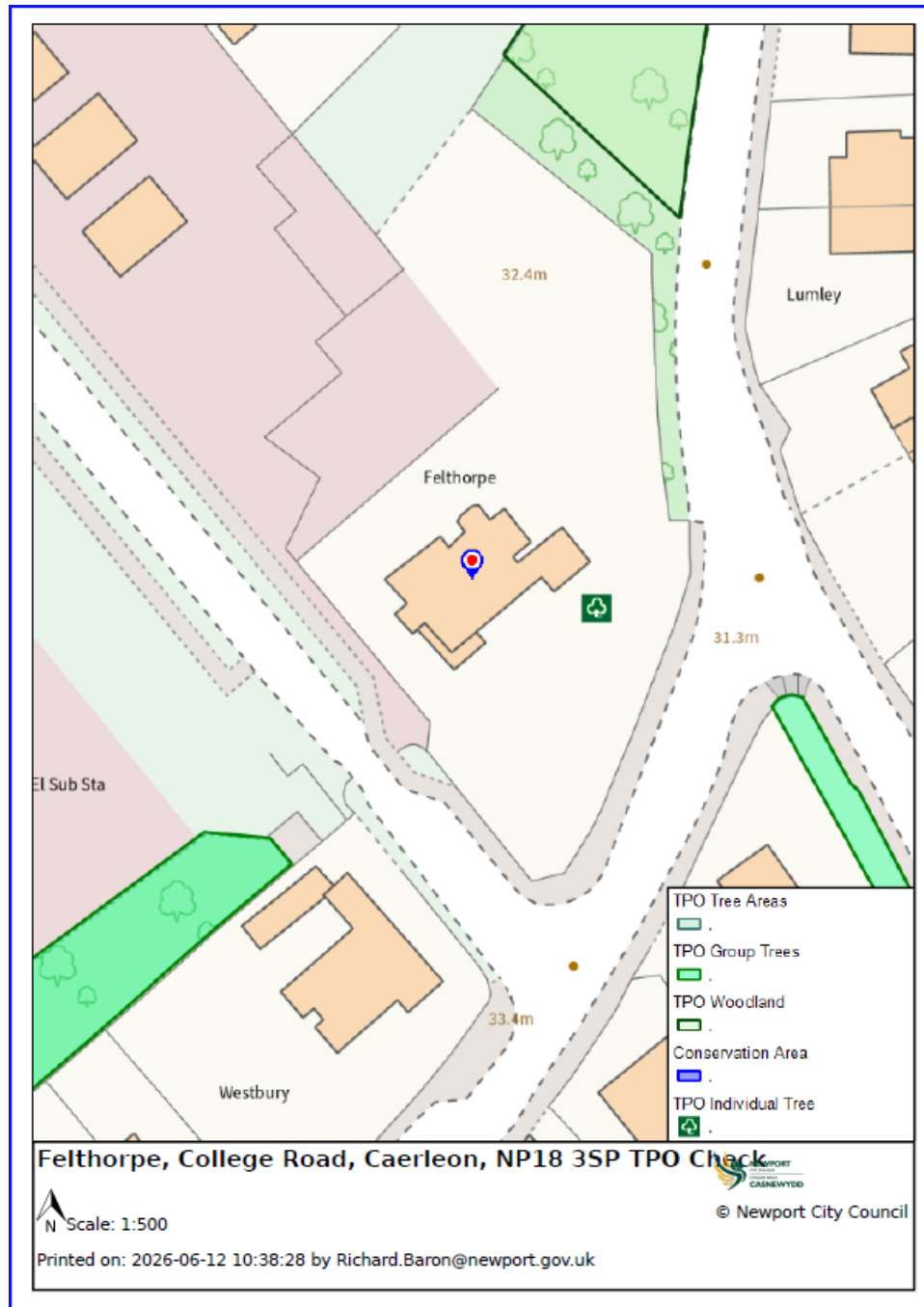
Figure 1 The design and construction process and tree care



APPENDIX C - SITE LOCATION PLAN



APPENDIX D - TREE PRESERVATION ORDER MAP





APPENDIX E - TREE PROTECTION PLAN

