

Arboricultural Implications Assessment & Arboricultural Method Statement

In accordance with
 BS: 5837:2012

At
Caerleon Former University Campus

On the instructions of
 Redrow Homes

Dated: January 2025 (Revision 4, update with NMA Phase 2)



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 Of

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Signed Steve Ambler	
Date	17 th January 2025

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INTRODUCTION, SCOPE AND BACKGROUND

This assessment is undertaken by Stephen Ambler, the Company founder, a professional arboriculturalist and Fellow of the Arboricultural Association. Having over 45 years' experience in the arboricultural industry, serving 19 of those years in local government as a principal arboricultural and woodlands officer. This Consultancy Practice was established in 1999 and later expanded in 2006 with the launch of a specialist 'Arboricultural Contracting Unit' under the revised name - Steve Ambler & Sons Tree Specialists Ltd. Stephen holds the relevant qualifications: -

- a) Certificate in Arboriculture (Royal Forestry Society)
- b) Professional Technician in Arboriculture (Arboricultural Association)
- c) Professional Diploma in Arboriculture (Royal Forestry Society)
- d) Fellow Member of the Arboricultural Association.

This Arboricultural Implications Assessment (AIA) and Arboricultural Method Statement (AMS) is a study to identify, evaluate and mitigate the extent of direct and indirect impacts on existing trees because of the current development proposal. It follows on to an earlier Tree Survey, Tree Categorisation, and Tree Constraints Plan¹ in which the trees were scored and assessed for their suitability for retention within the proposed development. The trees are clearly marked on the Tree Protection Plan with Tree Removal & Retention, within the Appendices.

The Arboricultural Method Statement element of this Report sets out to consider the physical and structural requirements of retained trees to maintain their good health and stability in relation to the pending construction works through identifying and reducing any conflict between them.

The earlier revision (V3 January 2025) of the AIA / AMS was produced following feedback from the Local Planning Authority, discussions with the design team and updated engineering sectional drawings which includes the swales as listed below.

Version 3 assessment is carried out using information provided on drawings –

- 18137(05) 1101N Proposed Site Plan
- 200922 - 19399 Engineering Layouts
- Levels Plan. 19399_C-300 - Draft - WIP - Engineering Layout-C-300-5
- Existing Utilities (Drawing Numbers: MU-001, 2 & 3; B-001, 2 & 3; E-001, 2 & 3; G-001, 2 & 3; S-001; W-001, 2 & 3; MU-002; B-002;)
- Access Ducts (Drawing No 3367/WCAB/A/S01
- edp5601_d016-E-Proposed Landscape Strategy
- edp5601_d025-B-Detailed Soft Landscape Plan
- edp5601_d025-D-Detailed Soft Landscape Plan
- edp5601_d031-A-Detailed Soft Landscape Design with Plot Planting
- Electrical Cable Routes (Drawing no. 33567/WCAB/E/S02
- Western Power Distribution – Existing Apparatus
- Gas Services – Existing. Drawing No. 33567/WCAB/G/S01
- Water Services – Existing. Drawing No. 33567/WCAB/W/S01
- CAE-HYD_XX_XX_DR_C_0600
- 18137(05)1600A - Tree Report - Sections T1 to T4

¹ S. Ambler - Tree Survey, Tree Categorisation, and Tree Constraints Plan at Former Caerleon Campus. Feb/April 2019.

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- 18137(05)1601A - Tree Report - Sections T5 to T9
- 18137(05)1602A - Tree Report - Sections T10 to T13
- 18137(05)1603 - Tree Report - Sections T12 to T13

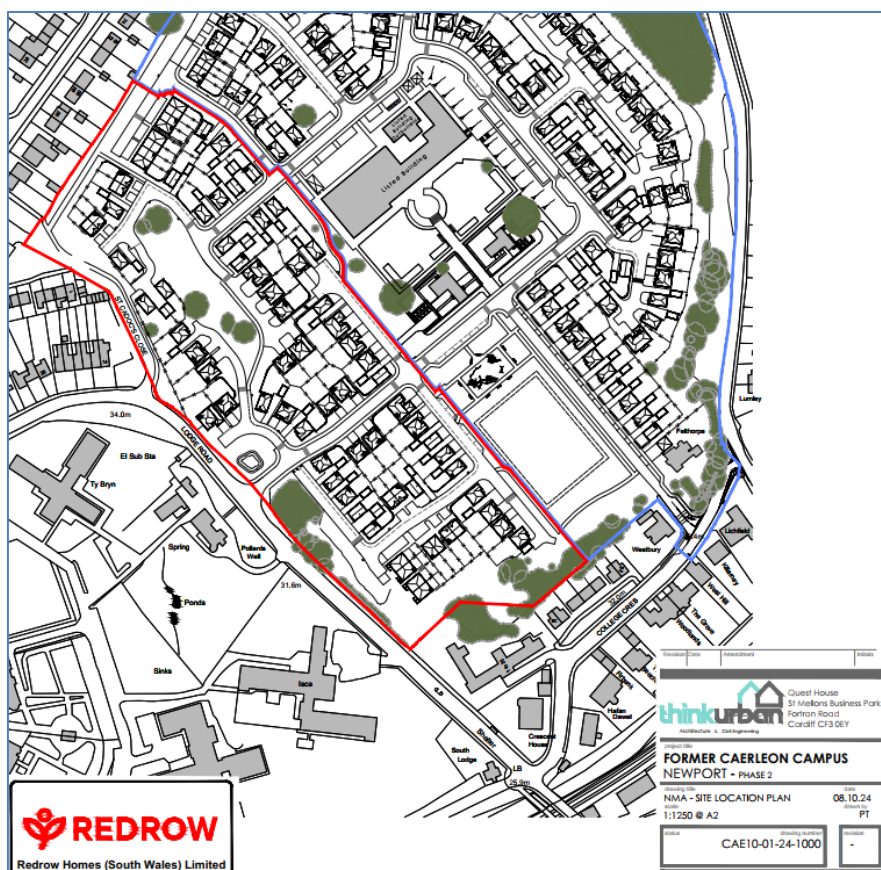
This forth revision is based on an application for a Non-Material Amendment (NMA) which covers part of the site only (Plots 91-170) and following submission of the following drawings listed below. A redline boundary plan showing the NMA is reproduced below.

- CAER-X26.5 - SABS NMA Information - 05.11.24 - TREES ADDED
- 10338-100-3AI-Engineering Plan
- edp5601_d025ae_UNCONTROLLED
- edp5601_d031aa_UNCONTROLLED
- CAE10-01-24-1001 - NMA Phase 2 - Planning Layout - 08.10.24
- CAE10-01-24-1000 - NMA Phase 2 - Site Location Plan - 08.10.24
- edp5601_d025-AB-Detailed Soft Landscape Plan
- edp5601_d031-Y-Detailed Soft Landscape Design with Plot Planting

The boundary surrounding the proposed development site and identified by plan attached hereto, in which the trees are contained and form the contents of this Report, is hereafter referred to as 'the site' .

The provision and acceptance of this Report are subject to the general terms and conditions of Steve Ambler & Sons Tree Specialists Ltd.

Red Line Boundary Plan of Non-Material Amendment Area concerning Plots 91-170.



PLANNING CONDITIONS

At the time of writing this Report, draft planning conditions have been supplied by the client and the key, tree related conditions are given below: -

Pre – commencement/construction conditions

03 No construction shall commence in phase 4 (as defined by the Phasing Plan Document) until full plan details of an emergency access route to serve as a shared footpath and cycleway adjacent to plots 120 and 123 (to include swept path analysis for a fire tender and appropriate measures to prevent general vehicular access), have been submitted to and approved in writing by the local planning authority. The details shall include a programme for implementation of these works as part of the phase along with an Arboricultural method statement to address any works that extend closer to the root protection areas of existing trees compared to the approved layout plan (revision 0).

Reason: In the interest of public safety and in accordance with policy GP4 of the adopted Local Development Plan.

05 Prior to the commencement of any development on site or ground preparation/clearance works, the preparatory setting out and requirements associated with the installation of tree protection and replanting measures shall be inspected by a suitably qualified officer of the Council (i.e. the Tree Officer) along with the site Arboricultural Consultant and site manager.

Reason: To protect important landscape features within the site and in accordance with policy GP5 of the adopted Local Development Plan.

06 No development, to include demolition, shall commence until an updated Tree Protection Plan (in accordance with BS 5837:2012) has been implemented in accordance with the Arboricultural Implications Assessment & Arboricultural Method Statement (to be Revision 3) required by condition 07 of this permission.

The development shall be carried out in accordance with the approved Tree Protection Plan and the fencing shall be retained for the full duration of the development, and shall not be removed or repositioned without the prior written approval of the Local Planning Authority.

Reason: To protect important landscape features within the site and in accordance with policy GP2 and GP5 of the adopted Local Development Plan.

07 Notwithstanding the details submitted, no operations of any description, (this includes all forms of development, tree felling, tree pruning, temporary access construction, soil moving, temporary access construction and operations involving the use of motorised vehicles or construction machinery), shall commence on site in connection within the development until a detailed Arboricultural Method Statement (i.e. revision 3) has been submitted to and approved in writing by the Local Planning Authority.

The development shall be carried out in full compliance with the revised and approved Arboricultural Method Statement.

Reason: To protect important landscape features within the site and in accordance with policy GP6 and GP5 of the adopted Local Development Plan.

08 Prior to the commencement of works to the swales affected by the plots identified below, full details of specific construction methods of the swale to deal with and set appropriate measures for any overhanging tree branches and preventing any drainage and/or oxygen change to existing tree roots. The cross-sectional details shall demonstrate the levels set out of the engineering layout (19399_C-300-7 Rev 3) with sections through the nearest tree, the swale and through to the nearest property at plots 15, 17, 18, 24, 35, 39, 75 and 76 and also section from nearest tree and relationship with plots 82, 104, 120, 139, 141 and 155.

Reason: To ensure that the retained trees are not adversely impacted from the development and in accordance with policy GP6 and GP5 of the adopted Local Development Plan.

09 No development, to include demolition, shall commence until an Arboriculturalist has been appointed, as first agreed in writing by the Local Planning Authority, to oversee the project (to perform a Watching Brief) for the duration of the development and who shall be responsible for -

(a) Supervision and monitoring of the approved Tree Protection Plan.

- (b) *Once the barrier fencing is erected, the approved Arboricultural Consultant must inspect and "sign off" in writing and submit a copy of this to the Local Planning Authority stating that the protective fencing is in the correct location and is fit for purpose.*
- (c) *c) Ensuring that all tree work is carried out in accordance with the approved Arboricultural Implications Assessment & Arboricultural Method Statement (to be Revision 3) required by condition 07 of this permission.*
- (d) *d) Supervision and monitoring of the approved tree felling and pruning works;*
- (e) *e) Supervision of the alteration or temporary removal of any Barrier Fencing;*
- (f) *f) Oversee working within any Root Protection Area;*
- (g) *g) Reporting to the Local Planning Authority;*
- (h) *h) The Arboricultural Consultant will provide site progress reports to the Council's Tree Officer at intervals to be agreed by the Council's Tree Officer.*

Reason: To protect important landscape features within the site and in accordance with policy GP5 of the adopted Local Development Plan.

10 *Prior to their extraction from ground, full details of the methodology for pruning, lifting, guying and replanting of the Japanese Maples and Magnolia Grandiflora and their proposed location and future maintenance of each tree(s) to be translocated (as shown on the approved Tree Protection Plan – Steve Ambler and Sons) shall be submitted to and approved in writing by the Local Planning Authority. Such details shall accord with the Arboricultural Method Statement required by condition 07 of this permission. The trees shall be translocated and thereafter maintained in accordance with the details agreed.*

Reason: To ensure valuable tree features on site are retained in more suitable positions in the interest of amenity and quality of layout and in accordance with policy GP5 and GP6 of the adopted Local Development Plan.

Pre –occupation conditions

12 *Prior to occupation of any dwelling in phase 4 the trim trail located within the arboretum shall be completed and available for use in accordance with details that shall first have been submitted to and agreed in writing by the Local Planning Authority. These details shall include an Arboricultural Method Statement to demonstrate how such works will be completed without harm to existing tree features in the area and to safeguard such features in the long term.*

Reason: To deliver agreed improvements to recreational, open space and permeability related aspects of the development and safeguard valuable tree features on site and in accordance with policy GP4 and GP6 of the adopted Local Development Plan.

General conditions

33 *All works affecting protected trees shall be undertaken under the supervision of the project Arborist. Notwithstanding the details provided, no works or landscaping/seeding of any description shall take place within the root protection areas.*

Reason: To protect valuable tree features on site and in accordance with policy GP5 of the adopted Local Development Plan.

35 *Except where otherwise agreed in writing by the Local Planning Authority, no existing trees shall be felled, topped or lopped, and no existing hedges shall be removed.*

Reason: To protect existing landscape features on the site and in accordance with policy GP5 of the adopted Local Development Plan.

36 *No excavation for services, storage of materials or machinery, parking of vehicles, deposits or excavation of soil or rubble, lighting of fires or disposal of liquids shall take place within the Root Protection Area.*

Reason: To protect important landscape features within the site and in accordance with policy GP5 of the adopted Local Development Plan.

37 *Notwithstanding the layout plan hereby approved the single parking space serving the building known as Ty Hywell and located entirely underneath the canopy spread of the protected Cedar tree, shall be omitted and no hardsurfacing or parking facility provided in this area. The area shall thereafter be kept clear of parking facilities.*

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. Ponthir Road and Lodge Road form the immediate south and east boundaries, with housing adjoining elsewhere. A Public Right of Way intersects the site and adjoins housing to the north to north-east.

Post Code: NP18 3NU

Ordnance Survey National Grid Reference: ST335911

The site lies 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.

The site comprises of a hugely diverse age range and species mix of trees, groups, woodland/parkland, an orchard and hedges (both formal and informal).

ARBORICULTURAL IMPLICATIONS ASSESSMENT

The following matters are considered under this Arboricultural Implications Assessment with remedial measures offered within the Arboricultural Method Statement element -

- A) Site Designation - Tree Preservation Order and Conservation Area protection
- B) The above and below ground constraints
- C) The construction of the proposed development
- D) Whether design can be modified to accommodate tree retention
- E) Infrastructure requirements, easements for above or below ground services; highway safety and visibility splays and other infrastructure provisions such as lighting, CCTV and signage.
- F) The end use of the space
- G) Whether tree losses from the development proposal can be mitigated
- H) A realistic assessment of the probable impact of the proposed development on the trees and vice versa with due allowances for their future growth and maintenance requirements.
- I) The relationship of windows to trees which may obstruct light considered
- J) Large trees can sometimes cause apprehension to occupiers of nearby buildings especially during windy weather
- K) Leaves of some species may cause problems, particularly in autumn by blocking gullies and gutters. Fruit can cause slippery patches, and the accumulation of honeydew may be damaging to surfaces and vehicles.
- L) The effects that development proposals may have on the amenity value of the trees both on and near the site

TREE PRESERVATION ORDER AND CONSERVATION AREA PROTECTION

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, primarily in terms of their amenity value and in some instances their rarity as a species found in Newport. E.g. 2 No Foxglove Tree (*Paulownia tomentosa*) a Fern-leaved beech (*Fagus sylvatica* 'Asplenifolia') and a Common walnut (*Juglans regia*).

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. in the Tables of Findings, each tree or group covered by this TPO, is highlighted using a green, block, background.

NOTE - Where trees have been recorded individually within the Tree Survey there is on occasion some uncertainty as to whether 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.

It must be recognised that during the construction phase, should injury or damage occur to any protected tree then an offence would have been committed which could result in prosecution. All parts of the tree are protected including the roots. If any person is found guilty upon prosecution of an offence, then fines of up to £20,000 can be implied and in some circumstances, sums in excess of this.

The Tree Protection Plan and Tree Survey¹ attempts to identify the trees and groups subject to a Tree Preservation Order and are labelled accordingly.

TREES - THE ABOVE AND BELOW GROUND CONSTRAINTS

The below ground constraints of trees are equal to the Root Protection Area (RPA) of all retained trees and the distance for each tree or group is provided within the Tables in both the Tree Constraints Plan and Report ¹. It is reproduced in Table 2, within the following section, in the column highlighted in yellow and this distance given is a radial distance which should be measured from the centre of the tree's stem.

The above ground constraints are provided by the crown spread primarily.

The Construction Exclusion Zone (CEZ) is defined by the protected area which incorporates the Root Protection Area and crown spread, whichever the greater.

In the attached Tree Protection Plan with Tree Retention / Removal (Appendices), the RPAs are shown as solid orange lines whilst the canopy spreads of the trees are shown as solid green, blue or grey lines (subject to their category rating).

Tree Removal, Retention & Protection Plan.

A Tree Protection Plan with Tree Retention / Removal is provided in the Appendices, is an essential tool providing information for protecting retained trees from injury and damage during construction works – it provides...

- 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.
- The crown spread measured at four cardinal points and coloured in relation to their retention category rating.
 - φ U - Dark red dashed line,
 - φ A - Light green
 - φ B - Mid blue
 - φ C - Grey
- The correct positioning for installing suitably robust barrier fencing.
- A suitable and robust barrier fencing detail as recommended in the British Standard¹.
- Trees proposed for removal
- Trees proposed for retention

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

THE PROPOSED DEVELOPMENT FOOTPRINT AND TREE LOSSES

The proposed development would result in the majority of tree losses being central to the site often seeing the younger or semi-mature trees planted within the hard landscaping removed. Most mature trees to the periphery of the site are retained where safe to do so. There are some exceptions, and the key are discussed below: -

A summary of trees retained and lost can be found on table 1, below which indicates all A category trees are to be retained with just over two-thirds of the B rated trees also retained. Approximately half of the C rated trees are due to be lost and the remainder are U category and deemed unsafe for retention.

Table 1. Summary of Trees Lost and Retained by Retention Category.

NOTES. A group is recorded as a single entity.

Retention Category	Key in table	Key in Tree Protection Plan	Numbers Lost to Development	Numbers Retained
A category		Green crown outline & stem	0	9
B category		Blue crown outline & stem	19	40
C category		Grey crown outline & stem	39	34
U category		36		

Table 2. Findings Table.

NOTES. Trees, groups and hedges lost to development are written in red text.

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
1	NA	Common lime	19	500	M	Street tree of reasonable form, adjoining the site.	None	40+	B 2	113	6.00
G1	NA	Cherry laurel, Japanese spotted laurel, Pittosporum.	5	150	M	Dense group on entrance opposite security gate.	None	20-40	C 2	10	1.80
2	5042	Common lime	20	725	M	Protected by Tree Preservation Order. Tree of reasonable form but with crown dieback by some 10%. <i>Kretzschmaria deusta</i> present. <i>K. deusta</i> leads to brittle fractures of the base and roots.	Fell to ground level, with replacement planting. Species and location to be agreed with Local Planning Authority	<10	U	0	0.00
3	5043	Common lime	21	575	M	Protected by Tree Preservation Order. Tree of reasonable form, with a bifurcated stem at 6-m AGL. Fork union occluded by ivy. Early crown dieback by some 5%. <i>Kretzschmaria deusta</i> present. <i>K. deusta</i> is a soft rot decay fungi that leads to brittle fractures of the base and roots.	Fell to ground level, with replacement planting. Species and location to be agreed with Local Planning Authority	<10	U	0	0.00
4	5044	Common lime	19	525	M	Protected by Tree Preservation Order. Tree of reasonable form but with crown dieback by some 5%.	Fell to ground level, with replacement planting. Species and location to be agreed with Local Planning Authority	<10	U	0	0.00

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						<i>Kretzschmaria deusta</i> present. <i>K. deusta</i> is a soft rot decay fungi that leads to brittle fractures of the base and roots.					
5	5045	Common lime	19	550	M	Protected by Tree Preservation Order. Tree of good form near frontage.	Remove basal epicormics and inspect base and lower stem. Arrange for a qualified arborist to re-inspect paying particular attention for signs of <i>K. deusta</i>	10-20	B 1	137	6.60
6	463	Pedunculate oak	16	850	M	Protected by Tree Preservation Order. Tree of reasonable form and somewhat squat in appearance. There is decay present within the south and east buttresses with notable reaction wood with the broadening of the stem base and affected buttresses. The type of decay in the two buttresses and sapwood to the west may be indicative of Honey fungus (<i>Armillaria mellea</i>) but this is not confirmed. The structural faults are within acceptable levels and as such remedial works are not required. However, the condition of this tree near a well-used road merits a regular condition inspection.	Access facilitation pruning may be required. Place into a cyclical tree inspection regime every 18 months. The next inspection should be undertaken whilst in full leaf to assess for any crown symptoms.	40+	B 2,3	327	10.20

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
7	462	Common lime	12	175	Y/EM	Tree of reasonable form with potential to develop into a key tree.	Tip back lower branches to create 2.5-m ground clearance	40+	B 2	14	2.10
8	464	Akin to Japanese cornelian cherry 'Kintoki'	10	200	EM/ M	Small tree/shrub of unremarkable form. Fractured crossing central stem.	Remove crossing and fractured stem and limb. Sever 1m ivy band.	20-40	C 1	18	2.40
G2	NA	Holly	7	125	EM	Unremarkable group located under canopy of oak.	None	40+	C 2,3	7	1.50
G3	NA	Oval-leaved privet, hornbeam	2	75	EM	Formal roadside hedge to frontage.	Maintain shape through box pruning.	20-40	B 2	3	0.90
G4	5046 - 5051	Ornamental flowering cherry	9	175	Y/EM	Trees of fair to reasonable form, in a row, slightly offset from hedge G3. Bacterial canker of cherry present but not extensive. Occasional compression forks developing.	Monitor health and structure every 3 years.	20-40	C 2	14	2.10
G5	NA	Irish yew, rhododendron, sweet bay, holly, variegated holly, apple, plum	10	175	EM	Jointly with Group 6, 7 - 23 trees protected under Tree Preservation Order. Dense unkempt group and possibly part of the remnant orchard (Group 7), offering screening to adjoining garden. Fruit trees tagged 5052- 5055.	Individual dominant shrubs and small trees could be selected for retention in order to improve the amenity value of the group. If retained undertake renovation pruning on fruit trees. Fell to ground level. the following: -	10-20	C 2	14	2.10

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						T128 (371) Elder (<i>Sambucus nigra</i>) -multi-stemmed specimen with crown dieback by 30%. 129 (5055) Apple - Root-plate failure with tree resting on boundary fence and overhanging Isca Court. 130 (5053) Apple- <i>Ganoderma applanatum</i> fungal bracket noted which causes a white rot with associated basal decay and a fractured and failed main stem.	T128 (371) T129 (5055) T130 (5053)				
9	466	Silver birch	18	350	M	Twin-stemmed tree of fair form, subordinate to tree 10.	None	20-40	B 2,3	55	4.20
10	467	Silver birch	18	650	M	Dominant tree of the two (9) and of good form.	None	20-40	B 2,3	191	7.80
11	5056	Cotoneaster Sp.	7	175	EM/ M	Insignificant small tree/shrub	None	10-20	C 2	14	2.10
12	5057	Goat willow	11	125	M	Protected by Tree Preservation Order. Mature stool with early mature growth. Multi-stemmed specimen from base. Inherently weak structurally and not deemed suitable for retention near high target occupancy housing.	Fell to ground level	10-20	U	0	0.00
13	5058	Holly	6	175	Y/EM	Protected by Tree Preservation Order. Insignificant small tree/shrub	None	40+	C 2,3	14	2.10

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G6	NA	Leyland cypress, Mexican orange blossom, apple, smoke bush	10	125	Y/EM	Jointly with Group 5, 7 - 23 No trees protected under Tree Preservation Order. Sporadic trees located in adjoining gardens.	None	20-40	C 2	7	1.50
14	5059	Judas tree	5	100	EM	Protected by Tree Preservation Order. Tree of poor form with a 30% dieback	Fell to ground level	<10	U	5	1.20
15	NA	Leyland cypress	15	400	Y/EM	Protected by Tree Preservation Order. Located in adjoining garden on boundary and offers some screening	None	20-40	B 2	72	4.80
G7	NA	Orchard consisting of mixed fruit trees	10	300	M	Jointly with Group 5, Tree's 6 – 23 are protected under Tree Preservation Order. Orchard comprising of well-spaced trees, some with a multitude of condition issues ranging from fractured limbs/primary branches, crossing branches, congested crowns & decay cavities. T124 (367) Apple - Basal wound to north at 100 degrees of stem circumference. Congested crown with multiple crossing branches. Fractured and partially attached wind damaged branches at 6-m AGL to the south, that have been pruned and shortened to the boundary.	Sever ivy and other climbers. Undertake renovation pruning on all fruit trees. T124 (367) Target prune crossing, damaged branches. 125 (368) Remove fractured limb. Monitor linear cavity on east stem every 18 months.	10-20	B 2,3	41	3.60

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						125 (368) Plum -Tree forks at 1.5-m AGL to become bifurcated. Three pruning stubs occur in this union effectively acting as wedges when they were live. Reaction wood to this previous force has widened the stem at the union. An elongated narrow decay cavity to the north between 1.8-m - 3-m AGL. Fractured and partially attached limb at 3-m AGL. 126 (369) Apple - Elongated narrow decay cavity between 0.3-m – 1.1-m AGL to a depth of 50-mm. Congested crown with multiple crossing branches. 127 (370) Apple - Small tree with crown dieback by 60%. Small but deep decay cavity at 300-mm AGL to south.	126 (369) Target prune crossing branches. Monitor cavity every 18 months. 127 (370) Fell to ground level.				
16	5060	Ornamental flowering cherry	6	300	EM/ M	Protected by Tree Preservation Order. Tree of below average form	Consider removal	<10	C 2	41	3.60
17	1381	Noble fir	11	350	EM	Protected by Tree Preservation Order. Tree of below average form becoming bifurcated with a tensile union. Offers some limited screening for adjoining house	Remove lower dead branches and sever ivy	40+	C 2	55	4.20
G8	NA	Hazel, holly, myrobalan plum, Japanese spotted laurel	10	125	EM	Unkempt group, offering some screening to the sub-station	Remove suckers if retained	20-40	C 2,3	7	1.50

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
Stump	NA	Goat willow	/	/	M	Recently felled tree with no re-growth form stump yet.	Treat with glyphosate-based herbicide in accordance with manufacturers instruction, to cease regrowth	10-20	U	0	0.00
G9	NA	Cherry laurel	6	100	EM/M	Isolated unremarkable group with two individual small shrubs just to the north-east	None	10-20	C 2	5	1.20
18	468	Horse chestnut	10	550	EM	Tree of reasonable form	May require access facilitation pruning	40+	B 2	137	6.60
19	1382	Holly	/	/	EM/M	Sparse foliage with crown dieback and young basal growth in response	Fell to ground level	<10	U	0	0.00
20	1383	Downy birch	16	225	EM	Remaining stem of two formed from ground level, of reasonable form	None	20-40	C 2,3	23	2.70
21	1385	Beech	13	150	Y/EM	Tree of reasonable form.	Consider removal of tree 20 to provide space for this tree's crown to develop	40+	B 1,3	10	1.80
G10	NA	Lawson cypress	16	300	EM/M	Multi-stemmed specimen with butt sweep.	Consider removal in light of issues in relation to High Hedges Act	10-20	C 2	41	3.60
22	1386	Holly	12	275	EM/M	Tree of reasonable form, with a bifurcated stem at 1-m AGL.	None	40+	B 2,3	34	3.30
G11	NA	Goat willow, cherry laurel, Himalayan honeysuckle, hazel	12	150	Y/EM	Unremarkable group, located near lodge entrance	Consider removal	10-20	C 2	10	1.80

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G12	NA	Yew	2	75	Y	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.	40+	C 2,3	3	0.90
23	1387	Pear	7	250	EM/ M	Tree of poor form. Scaffold limbs are 'dog legged' with acute changes of angle	If retained, undertake renovation pruning and remove deadwood	10-20	C 2,3	28	3.00
24	471	Pedunculate oak	15	475	Y/EM	Protected by Tree Preservation Order. Long lived species of good form near frontage.	Remove deadwood	40+	A 2,3	102	5.70
25	472	Lawson cypress	17	500	M	Tree of good form, near frontage with small conifers and shrubs adjoining	Consider removal in favour of oak tree T24, to allow its crown to develop unhindered	20-40	B 1,2	113	6.00
G13	NA	Ash, Lawson cypress with juvenile foliage, variegated holly, Wilson's honeysuckle, hazel, holly	11	150	Y/EM	Unremarkable group located near frontage to road and lodge. Ash Tag (1388) multi-stemmed with one stem having been felled and the other leaning out towards the road due to phototropic tendencies	Ash (Tag 1388) - fell to ground level and treat stump with herbicide in accordance with manufacturers instruction, to cease regrowth.	20-40	C 2,3	10	1.80
26	1389	Pear				Extensive basal decay with cavity. <i>Kretzschmaria deusta</i> present which is a soft rot decay fungi that leads to a sudden brittle fracture of the base and roots.	Fell to ground level	/	U	0	0.00
27	1390	Holly	10	175	EM	Triple stemmed specimen of average form	None	20-40	C 2,3	14	2.10

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G14	NA	Lawson cypress	14	300	EM/ M	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.	20-40	C 2	41	3.60
28	1392	Red oak	16	225	EM/ M	Twin stemmed specimen leaning with an asymmetric crown, predisposed to the south and road.	Reduce crown by 3-m distally	40+	C 2	23	2.70
29	1391	Red oak	16	275	EM/ M	Twin stemmed specimen of reasonable form.	None	40+	B 2	34	3.30
G15	475	Lawson cypress	18	525	M	Multi-stemmed specimens of average form located on low mound. Consider issues in relation to High Hedges Regulations. Several compressive forks present.	Monitor structural issues annually, if retained	20-40	B 2	125	6.30
30	473	Pedunculate oak	20	475	M	Protected by Tree Preservation Order. Twin stemmed specimen subordinate to tree 31. Tree of fair form with a dominant east stem	Reduce crown by 2-m distally	40+	B 2,3	102	5.70
31	474	Common lime	20	550	M	Protected by Tree Preservation Order. A single dominant stem remains with 3 x stems to the north, having been poorly removed to accommodate the nearby student block.	Monitor structural issues annually, if retained	40+	B 2	137	6.60

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						Decay developing in the three large diameter pruning wounds.					
32	476	Lawson cypress	18	600	M	Tree of fair form soon forking to become multi-stemmed. The main fork has enveloped the metal railing stanchion, whilst the forks at 2-m AGL are formed under compression.	If retained, install a two-way cable bracing system	20-40	B 2	163	7.20
33	1393	Sessile oak	19	475	EM/ M	Protected by Tree Preservation Order. Tree of reasonable form by metal gates on tarmac ramp. Small grouping of early mature holly & hazel under the canopy	Remove deadwood	40+	B 2,3	102	5.70
G16	NA	Irish yew	7	75	Y/EM	Closely spaced group in small beds, with limited rooting potential	None	40+	C 2	3	0.90
34	1394	Norway maple	8	200	Y/EM	Tree of good form in quadrant	None	40+	B 2	18	2.40
35	1395	Norway maple	8	200	Y/EM	Tree of good form in quadrant	None	40+	B 2	18	2.40
36	1396	White willow	10	325	EM	Unremarkable tree which is inherently structurally weak.	Consider removal in high target occupancy housing areas.	20-40	C 3	48	3.90
37	1397	Holly	8	125	EM	Unremarkable multi-stemmed specimen with 2 x central stems, reduced at 2-m AGL.	None	40+	C 2,3	7	1.50
38	1398	Common walnut	14	200	EM	Twin-stemmed tree of reasonable form, with a dominant east stem.	Monitor health annually	40+	B 1,2	18	2.40

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						Google images in leaf suggests a somewhat thinning upper crown.					
G17	NA	Lime sp	10	250	Y/EM	Row of well-spaced and well-formed trees planted on top of bank within Cherry laurel shrub bed. Most easterly tree has a developing compression fork.	Monitor compression fork on tree, to east end of row	40+	B 2	28	3.00
39	1399	Tulip tree	14	275	EM	Protected by Tree Preservation Order. Tree of good form in planting grill in paved seating area, adjoining the car park.	Built up area that would require very careful demolition and then the use of a large tree spade and guying system to support it. Likely to cause to much root disturbance. Fast growing species that could be replaced through planting several elsewhere in wider open spaces. Use at least extra heavy standards 14-16cm	40+	B 1,2	34	3.30
G18	1400, 2281, 2282, 2283	Himalayan birch	10	200	Y/EM	Protected by Tree Preservation Order. Group of 4 trees in the corner of a quadrant Trees of reasonable form. Several crossing branches and developing compression forks.	May require access facilitation pruning	20-40	B 2	18	2.40
G19	NA	Norway maple	5	100	Y	Planted in narrow raised strips demarking parking bays. Located in grills and stone setts. Can easily be replaced through mitigation planting.	Investigate rooting pit and improve rooting space if required and retained.	40+	C 2	5	1.20

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
40	2284	Ornamental flowering cherry	5	125	Y/EM	Unremarkable tree	None	20-40	C 2	7	1.50
41	2288	Himalayan birch	13	175	Y/EM	Tree of fair form, but subordinate to T42.	May require access facilitation pruning	40+	B 2	14	2.10
42	2287	Himalayan birch	14	250	Y/EM	Tree of good form and the dominate one in a pair with T41	May require access facilitation pruning	40+	B 2	28	3.00
43	2289	Sessile oak	17	400	EM	Protected by Tree Preservation Order. Extensive crown dieback with notable young growth within the internal crown.	Fell to ground level	<10	U	72	4.80
44	2290	Sessile oak	18	500	EM	Protected by Tree Preservation Order. Tree of good form.	Remove deadwood over target	40+	B 2,3	113	6.00
45	2291	Sessile oak	18	600	M	Protected by Tree Preservation Order. Twin stemmed specimen from ground level, of reasonable form.	May require access facilitation pruning. Remove deadwood over target.	40+	B 2,3	163	7.20
46	2292	Goat willow	10	250	EM	Protected by Tree Preservation Order. Inherently weak structurally and not suitable for retention near high target occupancy housing.	If retained, coppice.	20-40	C 3	28	3.00
47	2293	Sessile oak	18	550	EM	Protected by Tree Preservation Order. Tree of good form	Remove deadwood over target	40+	B 2,3	137	6.60

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M ²)	Root Protection Radius (M)
48	2294	Sessile oak	19	600	EM/ M	Protected by Tree Preservation Order. Tree of good form. Lateral limbs on site side likely to be subject to increased torsional loading that closer development will cause.	Remove deadwood and reduce lateral limb formed at 4-m AGL to the site side by 3-m distally.	40+	B 2,3	163	7.20
49	2295	Sessile oak	16	600	EM/ M	Protected by Tree Preservation Order. Forms a pair with T50. Tree soon becomes lateral at 2.5-m AGL predisposed towards the site. Notable fibre buckling under compression on stems and limbs	End weight reduction pruning to reduce loading, by 5-m distally	40+	B 2,3	163	7.20
50	2296	Sessile oak	16	525	EM/ M	Protected by Tree Preservation Order. Forms a pair with T49. Tree soon becomes lateral at 6-7-m above ground level, predisposed towards the road.	End weight reduction loading by 3-m distally	40+	B 2,3	125	6.30
51	2297	Ash	18	350	EM	Protected by Tree Preservation Order. Tree of good form located on edge of low stone retaining wall, with some signs of soil disturbance.	Monitor effect on wall every 2 years	20-40	B 2,3	55	4.20
G20	NA	Ash	15	125	Y/EM	Small group on edge of low stone retaining wall. Offers some screening but individually unremarkable.	Thin to favour better formed specimens and remove those with	40+	C 2,3	7	1.50

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Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
							symptoms of Ash dieback disease (<i>Hymenoscyphus fraxineus</i>)				
G21	NA	Cherry laurel	6	125	EM/ M	Dense group on top of bank that offers some screening. Isolated stems of Japanese knotweed (<i>Fallopia japonica</i>) noted to west end of group.	Treat Japanese knotweed with glyphosate-based herbicide in accordance with industry best practice and Manufacturers' instructions.	20-40	C 2	7	1.50
52	2298	Cherry 'Kanzan'	6	/	EM	Elongated compression fork from union at 1.2-m AGL to ground level.	Fell to ground level	<10	U	0	0.00
G22	NA	Ornamental flowering cherry x 4	10	150	EM	Unremarkable row of trees on bank to front of student accommodation block	None	10-20	C 2	10	1.80

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G23	NA	Ash, oak, sycamore, holly, hawthorn, goat willow, Norway spruce, hazel, lime, mulberry, European larch, Lawson cypress, black pine, Douglas fir, beech, cedar, wellingtonia, birch, coastal redwood, weeping willow	20	1000	M	Protected by Tree Preservation Order. Mixed broadleaved woodland and parkland further north. Comprising of predominantly native and naturalised species with the occasional planted exotics and some fine specimens. Issues include but not exclusively - windblown trees, small and medium diameter deadwood, phytophthora, fractured & failed stems / limbs and primary branches. Woodland canopy cover thins further northwards and conversely bramble increases, as light levels improve. Individual trees and sub-groups in this wider group have been recorded where they occur within influencing distance of the PRoW (trees 121-123, G39 & G40)	Woodland management plan required. Identify and plot / tag specimen trees. Undertake detailed tree condition inspection. Potential planting but not at the cost of overplanting around the specimen parkland trees.	40+	A 1,2,3	452	12.00
G24	NA	Chanticleer pear	11	225	EM	Planted in paved area within tree grills.	Investigate rooting pit and improve rooting space if required and retained	20-40	B 2	23	2.70
G25	NA	Hornbeam, ornamental flowering cherry, pear	4	150	Y	Young trees within tree pits/trenches within paviour car park.	Investigate rooting pit and improve rooting space if required and retained	20-40	C 2	10	1.80

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
53	2299	Deodar cedar	19	700	M	Protected under Tree Preservation Order. Specimen tree of good form. Several large flush pruning wounds. Large sweeping stems and lateral limbs gives it a similar form to Cedar of Lebanon.	Consider impact of changing wind dynamics and use of cable / propping bracing system once a layout is known.	40+	A 1,2	222	8.40
H1	NA	Yew with a section of Escallonia rubra 'Macrantha'	2	100	EM	Sections of mostly yew hedges with one section of Escallonia. Formal box cut hedge to front of main historical buildings	Maintain box cutting	40+	B 1	5	1.20
54	2300	Himalayan birch	10	150	Y/EM	Multi-stemmed specimen of average form with multiple stems of Sawara cypress (<i>Chamaecyparis pisifera</i>)	None	40+	B 2	10	1.80
H2	NA	Box	1	75	EM	Formal border hedge at entrance to main historic house.	Continue formal pruning	40+	B 1	3	0.90
55a, 55b	NA	Box	2	100	EM	Formally pruned to an umbrella shape. Located in raised planters on entrance to main historic house.	Continue formal pruning	40+	B 1	5	1.20
56	1641	Variegated holly	7	/	EM/ M	Located in grounds of old stone house. Extensive crown dieback by some 80%	Fell to ground level	<10	U	0	0.00
57	1642	Variegated holly	7	/	EM/ M	Located in grounds of old stone house. Extensive crown dieback by some 80%	Fell to ground level	<10	U	0	0.00
58	1643	Variegated holly	9	350	EM/ M	Located in grounds of old stone house. Early crown dieback of lower branches. Discoloured and potentially dysfunctional areas of bark / cambium.	Monitor crown health annually	10-20	B 2	55	4.20

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
59		Lawson cypress var. (with juvenile foliage)	5	100	Y/EM	Unremarkable conifer in grounds of old stone house	None	20-40	C 2	5	1.20
60	429	Common lime	20	800	M	Protected under Tree Preservation Order Specimen tree of good form in grounds of historic house.	May require access facilitation pruning	40+	A 2	290	9.60
61	430	Silver birch	14	325	EM/ M	Tree of fair form located between buildings	May require access facilitation pruning	20-40	C 2,3	48	3.90
62	1644	Silver birch	15	425	EM/ M	Tree of good form located between buildings	None	20-40	B 2,3	82	5.10
63	432	Silver birch	12	225	EM	Tree of below average form located between buildings	None	20-40	C 2,3	23	2.70
64	434	Young' s weeping birch	6	275	EM	Tree of average form located between buildings	None	20-40	C 2	34	3.30
65	1645	Young' s weeping birch	4	250	EM	Tree of average form located between buildings	None	20-40	C 2	28	3.00
66	428	Lawson cypress var	10	400	EM	Thinning crown with possible root damage and broadening base and buttress roots to south and east.	Consider removal if its near housing	<10	C 2	72	4.80
67	1646	Weeping birch	3	325	EM	Suppressed under crown of T66 and the stem soon becomes lateral to east at 3-m AGL.	Consider removal	10-20	C 2	48	3.90
68	426	Western catalpa	11	325	EM	Tree of good form in grounds surrounding the historic building	None	40+	B 1,2	48	3.90
69	1647	Pedunculate oak	10	250	Y	Tree of good form but young for species and could be replaced with mitigation planting	None	40+	B 2,3	28	3.00
70	1648	Pedunculate oak	10	175	Y	Tree of good form but young for species and could be replaced with mitigation planting	None	40+	B 2,3	14	2.10

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
71	1649	Pedunculate oak	8	150	Y	Tree of good form but young for species and could be replaced with mitigation planting	None	40+	B 2,3	10	1.80
72	425	Silver birch akin to var. 'Obelisk'	18	325	EM/ M	Tree of reasonable form	None	20-40	B 2,3	48	3.90
73	1650	Silver maple	16	525	M	Tree of average form, forking at 2-m AGL with west stem soon forking again. Small basal decay cavity to west.	Monitor decay and crown structure every 3 years	20-40	B 2	125	6.30
74	422	Akin to Stone pine	8	350	Y/EM	Tree of average form with limited rooting potential in hard landscaping	None	20-40	C 2	55	4.20
75	421	Akin to Stone pine	7	350	Y/EM	Tree of average form with limited rooting potential in hard landscaping	None	20-40	C 2	55	4.20
76	1651	Small-leaved lime	20	700	M	Protected under Tree Preservation Order Tree of good form.	May require access facilitation pruning	40+	A 2	222	8.40
G26	NA	Italian cypress var.	6	100	Y	Located in shrub beds within courtyard	None	40+	C 2	5	1.20
G27	NA	Ornamental flowering cherry, Himalayan birch, hornbeam	4	75	Y	Located in paved areas within car park. Several have had their leader snapped and/or pruned	None	20-40	C 2	3	0.90
77a, 77b	NA	Weeping cherry	4	125	Y	Trees of average form	Investigate rooting pit and improve rooting space if required	20-40	C 2	7	1.50
G28	NA	Hornbeam	5	150	Y	Located in paved areas within car park.	Investigate rooting pit and improve rooting space if required	20-40	C 2	10	1.80

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
78a	451	Hybrid black poplar	/	/	/	Cankered with crown dieback by 15%. Inherent structural weakness and not deemed suitable for retention near housing	Fell to ground level and replace with better performing species	10-20	U	0	0.00
78b	450	Hybrid black poplar	/	/	/	Cankered with crown dieback by 10%. Inherent structural weakness and not deemed suitable for retention near housing	Fell to ground level and replace with better performing species	10-20	U	0	0.00
79	449	Small-leaved lime	10	325	EM/ M	Tree of reasonable form with some lower stem epicormic growth	Remove lower stem epicormics.	40+	B 2	48	3.90
80	448	Horse chestnut ' <i>Flore Pleno</i> '	/	/	EM	Bleeding canker of Horse chestnut (<i>Pseudomonas syringae pv aesculi</i>) causing coalescing cankers. Memorial tree	Fell and consider replacement and retention of memorial plaque.	<10	U	0	0.00
G29	NA	Chanticleer pear	8	225	Y/EM	Three trees planted in a row in narrow grass verge	None	20-40	C 2	23	2.70
81	1652	Himalayan birch	8	150	Y	Tree of good form with tight compressive forks at 2-m above ground level	Monitor fork structure every 3 years	40+	C 2	10	1.80
G30 a, b	NA	Myrobalan plum, Himalayan birch, scarlet oak, Southern evergreen magnolia	8	150	Y	Generally, an insignificant group of fair-average form. Planted within shrub beds and amenity grass areas near buildings. The magnolia are an unusual species and variety.	G30A - PERSIAN IRONWOOD (<i>PARROTIA PERSICA</i>) Y/EM SHRUB. MANUAL TRANSPLANTING. KEEP PRUNING TO A MINIMUM & PLANT IN FULL SUN. G30B - THE MAGNOLIA X 4 TO BE TRANSPLANTED.	20-40	C 2	10	1.80

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
H3	NA	Cherry laurel, dwarf conifer, yucca, firethorn, variegated holly	3	100	EM	Initially dominated by Cherry laurel to the west providing a dense hedge offering screening but becoming less dense and mixed to the south of tree 104.	Maintain shape through pruning. Plant into gaps using native shrub species.	20-40	C 2	5	1.20
82	418	Horse chestnut		475	EM	Tree of average form with Bleeding canker of Horse chestnut (<i>Pseudomonas syringae pv aesculi</i>) and tarry black lesions	Monitor health annually	40+	B 2	102	5.70
G31	417, 1653, 1654, 1657	Horse chestnut, Norway maple, false acacia, cherry-crab	10	150	Y	Even aged group, planted in a row surrounding the grass verge of car park bays	None	40+	C 2	10	1.80
83	416	False acacia			Y	Extensive dysfunctional bark and cambium with low vitality. Tree of poor form.	Fell to ground level	<10	U	0	0.00
84	415	Poplar sp			M	Twin stemmed, having been poorly reduced 'topped' at 8-m AGL. Inherently structurally weak and not deemed suitable for retention near housing.	Fell to ground level	10-20	U	0	0.00
G32	NA	Hornbeam, cherry	5	125	Y	Located in paved areas within car park.	Investigate rooting pit and improve rooting space if required and retained	20-40	C 1	7	1.50
85	411	Apple	10	350	M	Tree of below average form with poorly pruned limb leaving a decaying peg.	If retained undertake renovation pruning	10-20	C 2,3	55	4.20
86	414	Apple	6	200	EM	Tree of poor form with decaying pruning wound at 2-m AGL	Consider removal	10-20	C 2,3	18	2.40

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
87	412	Apple	10	250	EM/ M	Tree of average form.	If retained undertake renovation pruning	10-20	C 1,3	28	3.00
88	413	Apple	10	325	EM/ M	Tree of below average form with fractured and partially failed limb at 2-m above ground level	Renovation pruning and target prune fractured limb	10-20	C 2,3	48	3.90
89	1658	Fern-leaved beech	18	575	M	Protected under a Tree Preservation Order. Specimen tree of an unusual variety. Forks at 1-m AGL to become bifurcated. Multiple low limbs form a deep down-swept crown giving the tree a compact appearance	None	40+	A 1,2	150	6.90
90	409	Foxglove tree	16	1025	M	Protected under a Tree Preservation Order. This is a large specimen tree and an unusual species within the UK. This tree has an eccentric cavity to the east but with adequate sound wall thickness in the three other cardinal points. The buttresses are sound to at least 30-cm depth although it appears one of the main eastern structural roots may be severed at 1.2 metres from the main stem, perhaps dating back to the construction of the surrounding student accommodation. This species has a relatively soft non-durable wood akin to poplar species, as can be seen from the low amplitude readings of sound wood in the test results. The wind loading and hollowing is having an effect as notable columns of reaction wood are forming because of stress and suspected fracture lines in a buttress and the stem itself. Given that this tree will be exposed following the demolition of adjoining buildings, its stem decay and lateral limbs, and its position to the eastern end of the group, if the	Reduce the crown by 3-m distally and remove all deadwood Reduce the southwestern lateral limb by 4-5-m distally Permanently fence out the tree from the proposed open space with high ornamental railings to deter access. Fencing to be set back at 10-m radially from the stem. Place on an annual condition inspection regime paying particular attention to crown physiology.	20-40	B 1, 2	0	0.00

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						tree is to be retained with a limited safe useful life expectancy, significant reduction work through crown modification and a close condition monitoring regime must be implemented. Close monitoring must involve an increased inspection regime annually with anticipated further diagnostic investigation required. Cyclic surgery interventions will also be necessary to control crown size, depending on stem residual wall strength and thickness. Its retention category has been downgraded due to condition issues and reduced amenity value with the required remedial works.	Monitor crown size versus the structural integrity of stem and buttress roots. NCC FAVOUR FELLING DUE TO CONDITION ISSUES IN HIGH TARGET OCCUPANCY LOCATION. Ecologist to inspect for bats prior to works commencing.				
91	405	Black mulberry	11	550	M	The tree has a failing compression fork at 1.5-m AGL with a 1-m long split in the union. A ratchet strap has been used to brace the failure and is under tremendous tension. Refer to Photograph 15, in Appendices	Not deemed suitable for retention in a high target occupancy setting. Fell to ground level	<10	U	137	6.60
92	404	Common walnut	16	625	M	Protected under a Tree Preservation Order. Specimen tree of good form. Large diameter lateral limb to the south at 2-m distally. Small cavity with notable reaction wood immediately around the opening at 2-m proximal to the parent stem on the west side. A climbing inspection finds the cavity to be structurally insignificant, being no wider than the narrow opening and only 100-mm	Branches may need to be temporarily tied up or back for access of machinery.	40+	A 1,2	177	7.50

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						deep. Use of a sounding hammer finds the decay to be localised. Insignificant small decay cavity on south-east lateral limb at 2.5-m AGL, 4-m proximal to parent on the south side. Small diameter deadwood throughout, regarded at a normal level in association with cladoptosis.					
93	479	Magnolia	/	/	EM	Tree of poor form being multi-stemmed from base. Dead north-west stem. The remaining stems are mostly lateral with compressive fork unions.	Fell to ground level	<10	U	0	0.00
G33	NA	Beech, Himalayan birch, sweet chestnut, Swamp cypress, fastigate ornamental cherry	14	250	Y/EM	Mixed group of trees, generally of good form. If retained they could be left as a group, but also individual specimens could be selected at this young age. If lost, mitigation planting with large stock is also an option due to their young age.	None	40+	B 2	28	3.00
94	4541	Lawson cypress	18	625	M	Tree of good form. Broadening of base noted to the west and south	Sever 1m ivy band.	40+	B 2	177	7.50
95	436	Silver birch	17	350	EM/ M	Tree of good form, with several bark wounds and a thinning upper crown with small diameter deadwood	Consider removal	<10	C 2,3	55	4.20
96	4542	Silver birch	14	350	EM/ M	Crown dieback by some 20%	Fell to ground level	<10	U	55	4.20
97	438	Apple			EM	Tree of poor form poorly pruned with coalescing decay cavities and wounds on the lower stem.	Fell to ground level	<10	U	0	0.00

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
98	439	Apple			EM/M	Tree of poor form poorly pruned with coalescing decay cavities and wounds on the lower stem.	Fell to ground level	<10	U	0	0.00
99	4543	Himalayan birch	11	150	Y	Tree of good form on edge of bank	None	40+	C 2	10	1.80
100	4544	Foxglove tree	16	850	M	Protected under a Tree Preservation Order. Specimen tree and infrequent within the UK. The retention category has been downgraded due to significant structural issues and deemed unsafe to retain. The stem does not have the required minimum sound wall thickness within the stem cylinder, and it fails by a reasonable margin in all directions. In addition, the two and only significant buttresses and structural roots have decay at 200-mm depth. Given the increased exposure that this tree will be subjected to when the three storey buildings are demolished and its location within a small open space within a proposed housing development, it is not deemed practical or safe to retain. A replacement tree will need to be planted, to be advised by the Local Planning Authority.	Fell to ground level. Ecologist to inspect for bats prior to works commencing.	20-40	U	327	10.20

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
101	4545	Copper beech	18	600	EM/ M	Protected by Tree Preservation Order. Tree of below average form forking at 1.4-m AGL to form, four stems. The fork unions are slightly compressive.	If target occupancy increases, install 4-way cable brace to stabilise the members which should be fitted in full accordance with the recommendations of the British Standard Recommendations for Tree Work 3998: 2010 and reduce crown by 3-m.	40+	B 2	163	7.20
102	403	Cherry 'Kanzan'	5	350	EM/ M	Tree of poor form. Typically, congested crown with crossing branches.	Consider removal otherwise Remove deadwood, crossing branches and thin crown by 15%. May require access facilitation pruning.	10-20	C 1	55	4.20
103	402	Willow-leaved pear	6	275	EM	Tree of poor form, subordinate to T101. Ivy clad.	Fell to ground level.	10-20	U	34	3.30
104	407	Common lime	18	475	EM/ M	Tree of good form on roadside boundary near gas sub station	May require access facilitation pruning	40+	B 2	102	5.70
105	406	Horse chestnut			EM/ M	Basal decay with a large coalescing decay cavity on the stem. Decay wound up to 5-m AGL from base.	Fell to ground level	<10	U	0	0.00
H4	NA	Cherry laurel, oval-leaved privet.	3	75	Y/EM	Formal hedge around former nursery, near entrance.	Offers some screening	20-40	C 2	3	0.90
106	NA	Apple	5	100	Y	Insignificant tree in garden of former nursery	None	40+	C 2,3	5	1.20

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
107	NA	Lawson cypress	10	200	EM	Tree of reasonable form slightly subordinate to T108, in garden of former nursery	None	40+	C 2	18	2.40
108	4546	Norway maple	15	300	EM	Tree of good form in garden of former nursery	None	40+	B 2	41	3.60
109	NA	Rowan	6	125	Y	Tree of reasonable form in garden of former nursery	None	40+	C 2,3	7	1.50
110	447	Lawson cypress	9	200	EM	Tree of average form on boundary with road, in garden of former nursery. Twin-stemmed forking from base under slight compression.	Consider removal	20-40	C 2	18	2.40
111	NA	Lawson cypress	8	200	Y/EM	Tree of average form on boundary with road, in former garden of nursery. Subordinate to T112.	None	40+	C 2	18	2.40
112	4548	Ash	16	400	EM/ M	Tree of below average form on boundary with road, in garden of former nursery. Forks under tension at 1.2-m AGL and several times again to form an open broad crown. Likely to outgrow its position and damage the boundary wall in time as secondary stem thickening occurs and cell turgor pressure of its roots disturb the wall.	Consider removal	20-40	C 2,3	72	4.80
113	4547	Sycamore			EM	Twin-stemmed specimen from base, forking under compression, at 4-m AGL.	Fell to ground level	40+	U	0	0.00
114	4549	Sycamore	15	325	EM	Tree of below average form on boundary with road, in garden of former nursery. Forks under compression at 3-m AGL. Crossing stems at 5-m AGL.	Consider removal	40+	C 2	48	3.90

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
115	4550	Leyland cypress	17	450	M	Formally twin-stemmed with the south stem having been removed. Significant butt sweep, leaning slightly eastwards with mounding of soil to the west and a notable gap formed between its roots and the wall. Refer to Photograph 20, in Appendices	Fell to ground level	10-20	U	0	0.00
G34 a	NA	Hazel, hawthorn	10	150	EM/ M	Primarily located in garden behind timber board fence	None	20-40	C 2,3	10	1.80
G34 b, c	NA	Holly, hawthorn	11	275	EM/ M	Small group bordering end of garden offering some screening value.	None	20-40	C 2,3	34	3.30
H5	NA	Lawson cypress	3	200	Y/EM	Small section of hedge bordering end of garden offering screening. Unkempt on the side of the Public Right of Way but has been reduced in height.	None	40+	C 2	18	2.40
116	NA	Sessile oak	16	600	M	Dominant tree located in garden beyond conifer hedge (H5).	None	40+	A 2,3	163	7.20
G35 a, b, c	NA	Ash, hawthorn, field maple, elder, hazel	10	250	EM/ M	Remnant unkempt native banked hedge. Occasionally sporadic. In the case of G35c an open narrow woodland abuts with a public open space further afield. Larger individual trees have been recorded if their RPA exceeds that of the remnant hedge.	Subject to ownership, fell dead hawthorn to south of G35a. Tip back overhanging branches to give 2.4-m clearance along path.	40+	B 2,3	28	3.00

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						Open deep banked stream to west of hedge, which is culverted to the southern end. Larger trees on far side of stream are not considered as their roots and crowns do not pose a constraint.	Note - Potential mitigation opportunity to plant up gaps with native hedge species.				
117	NA	Sessile oak	16	750	M	Tree of good form in remnant banked hedge.	Remove deadwood	40+	B 2,3	254	9.00
118	NA	Ash	11	150	Y	Twin stemmed tree of poor form	None	40+	C 2,3	10	1.80
119	NA	Sessile oak	19	950	M	Dominant tree located in scrub wood beyond G35c. Small basal decay cavity to west. Small and medium diameter deadwood.	Subject to ownership, remove deadwood over target only	40+	A 2,3	408	11.40
G36	NA	Ash, field maple	13	300	EM	Four trees of fair form near boundary fence.	None	40+	C 2,3	41	3.60
H6	NA	Leyland cypress with mixed broadleaves & a cherry laurel	11	200	Y	Located in garden of adjoining properties and overhanging the Public Right of Way. Unclear if they are rooting under the Public Right of Way.	Subject to ownership, Crown lift overhang to 2.4m clearance.	40+	C 2	18	2.40
G37 a, b	NA	Hawthorn, Lawson cypress, holly var, Norway spruce, rowan, cherry, Mexican orange blossom, flowering current, firethorn, & other ornamental shrubs	10	150	Y/EM	Located in gardens of adjoining properties and just overhang the Public Right of Way in certain places. Occasionally sporadic. Unlikely to be rooting under the Public Right of Way.	None	40+	C 2	10	1.80

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
120	NA	Pedunculate oak	12	450	EM	Tree of fair form in garden of adjoining property, with its crown overhanging the Public Right of Way. Unclear if its rooting under the tarmac path. Slightly thinning crown with deadwood over path.	Subject to ownership, remove overhanging deadwood to path	40+	B 2,3	92	5.40
G38	NA	Hawthorn, holly, ash, horse chestnut	10	200	Y/EM	Unremarkable group of trees on small section of land adjoining the Public Right of Way, off Ponthir road. Crowns just overhang the path in a few locations, and they are unlikely to be rooting under the Public Right of Way.	None	40+	C 2,3	18	2.40
121	NA	Sycamore	10	175	Y/EM	Multi-stemmed specimen in G23, derived from a stool abutting boundary fence and Public Right of Way. Already in contact with fence and some signs of rooting under the Public Right of Way.	Consider felling and treat stump with herbicide to cease regrowth in accordance with manufacturer' s instructions.	40+	C 2	14	2.10
122	NA	Pedunculate oak	14	450	EM/ M	Tree of good form in G23, within influencing distance of Public Right of Way, with an overhanging crown but is unlikely to be rooting under the tarmac path.	None	40+	B 2,3	92	5.40
G39	NA	Ash, hawthorn	10	150	Y/EM	Two Ash trees in group adjoin the boundary fence in G23, whereas the more mature hawthorn is set back. The ash will be rooting under the Public Right of Way but it' s unlikely the hawthorn will be.	Consider felling the two ash trees and treat stump with herbicide to cease regrowth in accordance with manufacturer' s instructions.	10-20	C 2,3	10	1.80

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
123	NA	Sycamore	16	500	EM/ M	Tree of reasonable form on boundary fence within G23. Becomes bifurcated at 2.5-m AGL with the fork union formed under slight compression. The crown overhangs Public Right of Way and roots seemingly occur underneath the tarmac surface.	Remove ivy on main fork and inspect.	40+	B 2	113	6.00
G40	NA	Sycamore with ash	20	450	EM/ M	Linear group of trees in G23 within 2-3-m of the boundary fence. Crowns overhang the Public Right of Way and there are signs of rooting under the tarmac path.	Remove ivy on main forks and inspect.	20-40	B 2,3	92	5.40

Tree Felling and Surgery

Under normal circumstances, the 'approved'² tree surgery and felling works should be completed in full prior to the erection of the Tree Protective Barrier Fencing and must come within the Watching Brief element.

Any additional access facilitation pruning to that already recommended and deemed necessary to prevent injurious contact between demolition plant 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.

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.

Tree works shall be supervised by the Project Arborist through the Watching Brief element.

All trees approved for felling (shown on the 'approved' Tree Protection Plan with Tree Retention / Removal) should be clearly marked by the Project Arborist on-site beforehand.

Tree felling 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-matts should be used. No vehicles are permitted within the RPA of any retained tree, without the use of load spreading material.

All contractors and site operatives 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 the provision of 'toolbox talks'.

NOTE - Legal issues relating to tree felling should also be observed. Refer to Section 'Legal Constraints'.

ANY LANDOWNER OR LAND MANAGER SHOULD BE AWARE THAT - Trees must receive regular tree inspections by persons with adequate specialist arboricultural qualifications. A landowner has a duty of care imposed by statute and common law to do so and keep records of such (see legal constraints below). For further advice contact www.trees.org.uk

Tree felling and surgery works should only be undertaken by trained, competent and appropriately certificated personal with adequate experience and public, third party and employers liability insurance to £5,000,00. Always ask for proof from the contractors prior to engagement and seek references where necessary.

Translocated Trees.

As identified within Planning Condition 10.0 and labelled on the Tree Protection Plan, the proposed translocation of the *Magnolia grandiflora* (x 4), Japanese maple (*Acer palmatum*) glade and the singular Persian ironwood (*Parrotia persica*) must be undertaken prior to any demolition activities.

This requires a specification that should form part of the sites overall landscape plan to ensure their new planting positions, are best suited to their climactic and site requirements, and that their maintenance ensures they thrive.

² Approved by the Local Planning Authority

Tree Protection Fencing

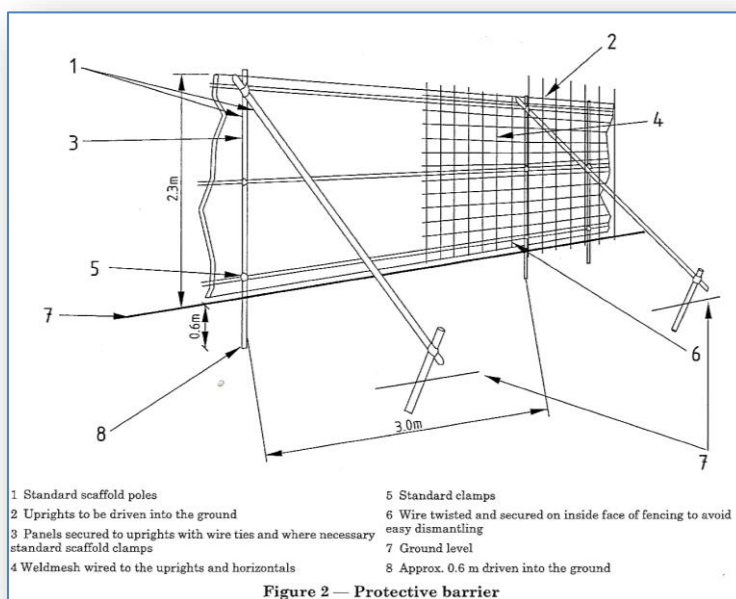
Before any materials or machinery are brought onto site, demolition, stripping of soil or development of any kind commences, all trees to be retained must be protected using robust physical barriers (Refer to Fig 2 & Fig 2 , below) and where necessary, ground protection plates positioned. The correct location for the Tree Protection Barriers is shown in the Tree Retention, Removal & Protection Plan in the Appendices. 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 under the guidance of the Project Arborist. Barriers should be monitored and maintained throughout the construction phase to ensure they remain rigid, complete and fit for purpose

NOTES

- Any works occurring within any RPA **must** be covered by an 'Approved' ³ Arboricultural Method Statement and may only proceed under the supervision of the Project Arborist.
- Where required, pre-development tree work may be undertaken before the installation of tree protection measures under the guidance of the Project Arborist 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.
- It should be confirmed by the Project Arborist 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.

Individual Trees – Protected using Default Specification (Fig 2).

The default tree protection fencing specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts. The vertical tubes should be spaced at a maximum interval of 3 metres and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.

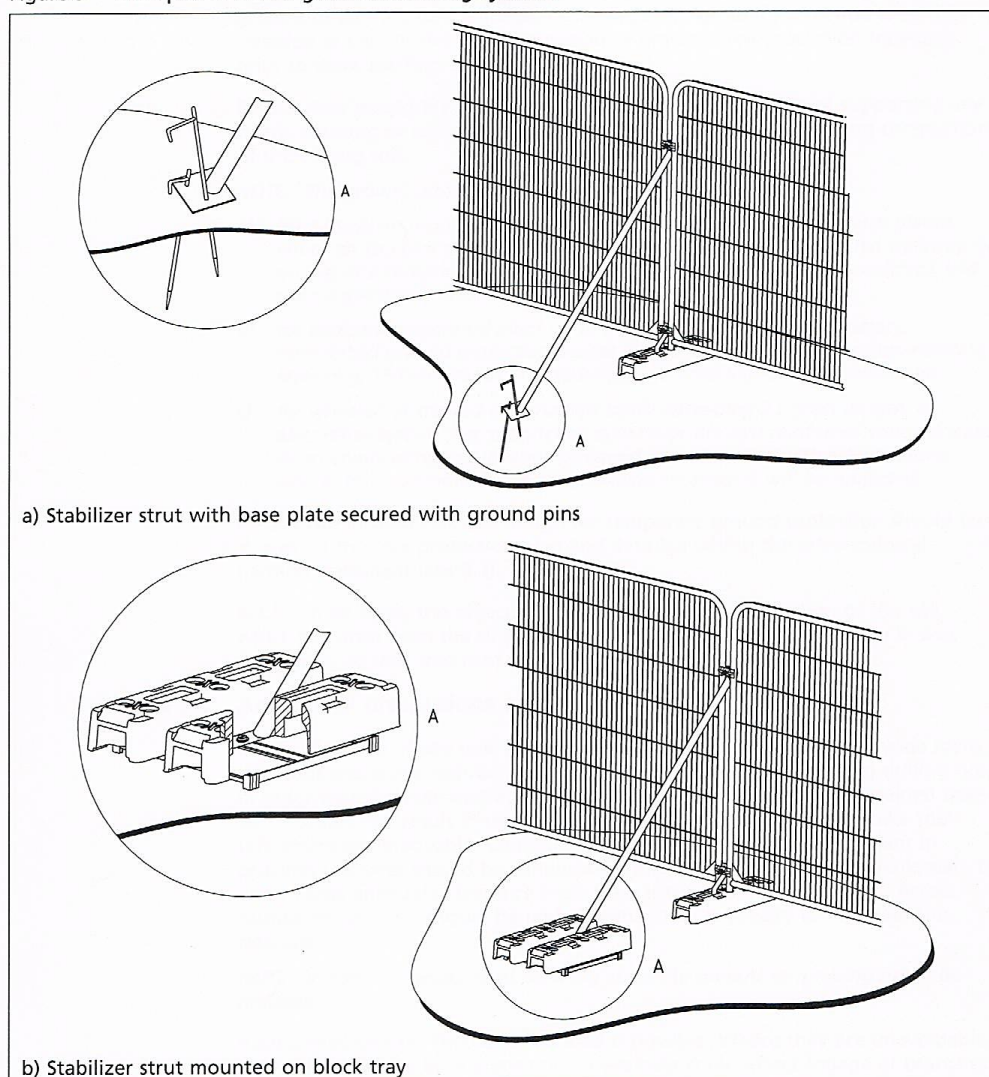


³ Approved by the Local Planning Authority

Groups & Hedges – Protected using the Alternate Specification

Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification can be applied. Erect 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 should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 metre and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 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).

Figure 3 Examples of above-ground stabilizing systems



NOTES

- 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.
- All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE - NO ACCESS".



REMOVAL OF EXISTING STRUCTURES AND HARD SURFACES

Demolition of the existing buildings is required, and this is a substantial undertaking on this site. Retained trees that are particularly close in proximity to existing structures includes G23 (south section), T30-51, T76, T88, T89, T90, T92, T102, T101 & T109.

NOTE.

Phase 1 demolition has been previously considered within ⁴, the principals of which can be rolled out across all phases of demolition. Further general guidance is given below: -

Method Statement

1. Engage a Project Arborist for the duration of works to monitor and to provide arboricultural advice as necessary.
2. The erection of protective barrier fencing must be in place and approved by the Project Arborist prior to any demolition activities including the movement of plant, equipment and storage of materials. This can be phased in accordance with demolition activities if supervised by the Project Arborist and agreed by the Local Planning Authority.
3. Once the barrier fencing is erected, the Project Arborist must inspect and sign off as adequate and fit for purpose prior to any site movement or possession by contractors is made.
4. All plant, demolition & dust suppression equipment **must** operate outside of the Root Protection Area or crown spread whichever the greater. this includes the storage even temporarily of materials and any arisings. If this is not possible, tree protection fencing may only be offset to expose some of the RPA in consultation and under supervision of the Project Arborist 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 Project Arborist / LPA.
5. The advice of an Arboriculturist should be sought where underground structures are present within the RPA (none known at this time) which are, or will become, redundant. In general, it is preferable to leave such structures in situ, as their removal could damage adjacent tree roots.
6. When removing existing hard surfaces above RPA' s – all plant and equipment should operate whilst positioned on the existing hard surface. Plant and equipment should not encounter any unprotected ground surface and where the existing hard surface

⁴ Caerleon University Campus Arboricultural Method Statement_TPP Phase 1 Demolition. July 2020. S. Ambler

being removed is not strong enough or of sufficient width to offer support, then load spreading ground plates shall be necessary. Care should be taken not to disturb tree roots that might be present beneath it.

7. 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 above ground parts of any retained tree.
8. Great care should be taken not to damage the trunk or branch framework, and additional protection may be necessary e.g. trunk protection and tying back branches.
9. Hand-held tools or appropriate machinery should be used (under arboricultural supervision) to remove the existing surface, working backwards over the area, so that any plant or machinery is not moving over exposed ground.
10. 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 Project Arborist.
11. 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.

INFRASTRUCTURE REQUIREMENTS AND SERVICE SUPPLIES

Tree roots can be damaged where services are installed within the RPA of any retained tree. Also, disruption to underground services may occur if they are placed within the root-plate zone as tree roots can cause damage to them. The RPA therefore should be taken as a minimum constraint to the development with regards the installation of underground services and greater distances should be allowed where possible.

The trees crown is also a constraint to the development and should be considered when seeking to install services or when operating plant and equipment. Sometimes the crown of a tree exceeds the RPA. Both matters will be considered in detail within the Arboricultural Method Statement.

Services

As would be expected on a site of this nature having supported a developing University Campus, the provision of existing services occurs throughout the proposed re-development area. A review of the current and proposed water; electricity; gas; BT; streetlighting; foul & surface water plans found several routes in areas of trees or in close proximity. Certain services (marked with 'X' s on the service plans) are proposed for disconnection near trees G1, G23 (TPO), T53 (TPO), T76 (TPO), T104 in favour of diversions that do not affect trees.

Mechanical Trenching

Mechanical trenching for the installation of underground apparatus and drainage severs any tree roots present and can change the local soil hydrology in a way that adversely affects the health of the tree/s and affect the health and stability of the affected tree/s. Care should be taken in the routeing and methods of installation of all underground apparatus. Wherever possible, apparatus should be routed outside RPAs.

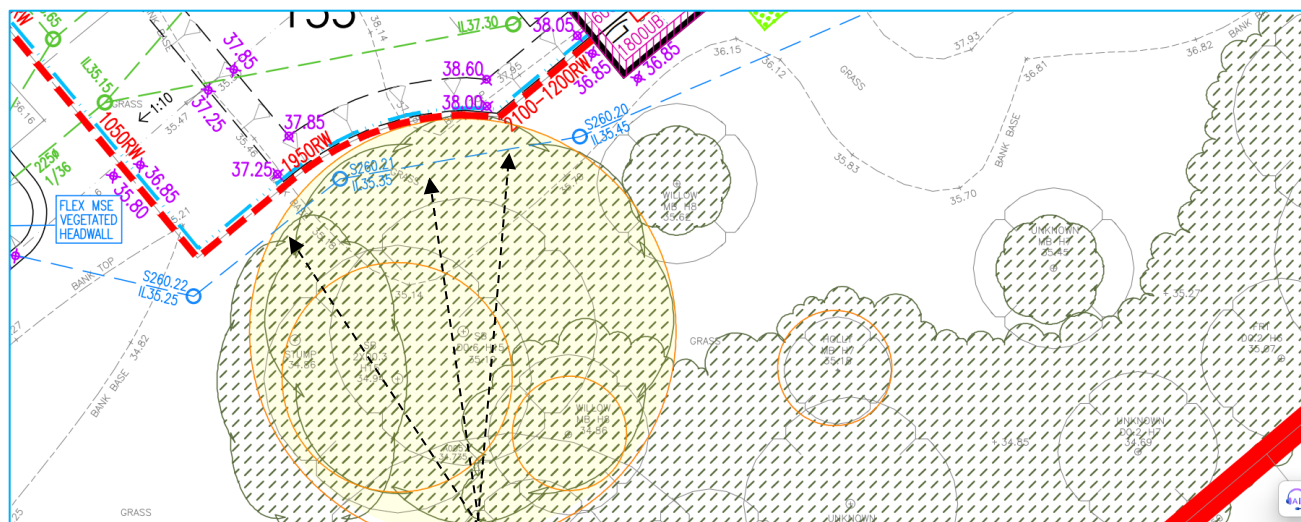
Where apparatus is to pass, detailed plans showing the proposed routeing should be drawn up in conjunction with the PA. In such cases, trenchless insertion methods should be used (See Table 3 below), with entry and retrieval pits being sited outside the RPA, if roots can be retained and protected. Hand excavation might be acceptable for shallow service runs.

Drainage

- **Conflict with Tree 10.** See screen shot below.

The tree highlighted in yellow below is identified as T10. A drain is proposed within its RPA and is shown as a dashed blue line which is highlighted in the plan extract below using 3 black dashed arrows. Open trenching to install drainage will sever all roots present along the line of the trench and so must be avoided.

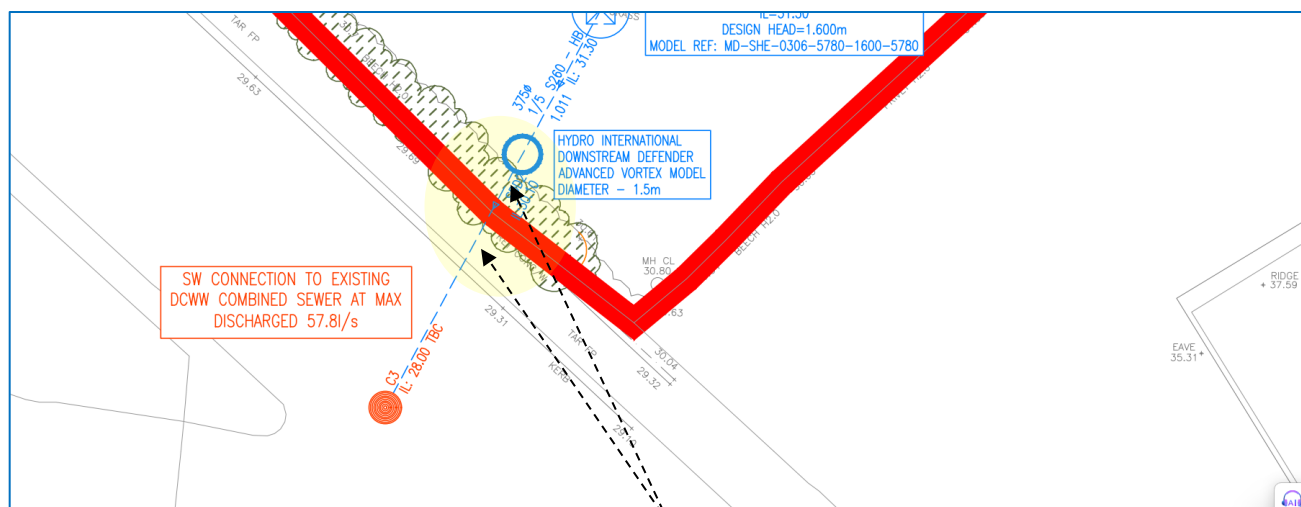
Recommendations –Tree 10 - follow the method statement below for trenchless technology.



- **Conflict with G3**

The area of hedgerow highlighted in yellow below is identified as G3. A drain is proposed within its RPA and its position is shown as a dashed blue line which is highlighted in the plan extract below using 2 black dashed arrows. Open trenching to install drainage will sever all roots present along the line of the trench and so must be avoided.

Recommendations –Group 3 - follow the method statement below for trenchless technology.



Services to be disconnected in the vicinity of trees (G1, G23 (TPO), T53 (TPO), T76 (TPO), T104) will not involve the removal of any apparatus as this has the potential to disrupt and damage tree roots or crowns. Several of the trees affected are afforded protection under a Tree Preservation Order.

Recommendation - Should any apparatus needs to be removed within the Root Protection Area or crown spread of retained trees then a method must be agreed in consultation with the Project Arborist and under their supervision.

It is recognised that occasionally further connections or diversions may be required or when pegging-out, service runs may be altered slightly due to drawing to ground discrepancies or to suit local conditions. Where this is the case, detailed plans showing the proposed re-routing and conflict should be drawn up in conjunction with the Project Arboriculturist for approval and will require their supervision.

Mechanical trenching for the installation of underground apparatus and drainage severs any tree roots present and can change the local soil hydrology in a way that adversely affects the health of the tree/s. In such cases, trenchless insertion methods should be used (See Table 3, below), with entry and retrieval pits being sited outside the RPA. 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 Project Arborist.

Trenchless Technology

Where arboricultural constraints present themselves, as is the case here, no-dig subterranean construction is clearly the preferred option, whereby underground ducts or cables can be laid beneath the root-plate of trees using alternative methods to open excavation and. (Refer to Table 3 below taken from the BS 5837) Such alternatives would include....

- (1) Impact moling.
- (2) Surfaced launched directional drilling.
- (3) Thrust boring.
- (4) Pipe ramming.

Impact moling is perhaps the most common technique where a percussive mole (soil displacement hammer) is launched from an excavation pit to displace the soil and form a bore. The new conduit is normally drawn in behind the mole or pulled back into the bore using the hammers reverse action. Pneumatically driven moles, in which the soil is displaced by the action of a percussive piston, have been developed in the range 30 – 180-mm diameter for a single operation, with repetitive multiple passes to achieve 200 – 250-mm diameter. Utility companies and their contractors use moles daily to lay new or replace existing services usually up to about 63-mm diameter. However, larger bores are also common laying pipes up to 180-mm.

Alternatives to Trenchless Technology

Excavating trenches using hand digging methods close to trees is an accepted alternative providing roots above 50-mm are not severed or damaged in the process. Services may be installed beneath the web of tree roots although digging is painstakingly slow and laborious. This approach usually demands the onsite presence of an Arborist to oversee the day to day digging which often becomes a condition of planning. It is unlikely this method would prove a viable alternative due to the significant length of the intended route and cost implications associated with labour and a supervising arborist. The use of an Air Spade is advisable and maybe requested by the PA where ground is difficult and when many roots are present

Arboricultural Method Statement - Services.

1. The Client is to mark out the proposed route of the service runs 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 offset just sufficiently for the works to be undertaken and immediately prior to the works.
6. The trees crowns and stem should be protected from possible collision damage and included within the area protected by the tree protective barrier fencing if possible. if not, tying back branches or pruning and stem protection may be necessary.
7. Install stem protection where necessary in accordance with Figure 1. PA to assess and advise.
8. Any proposed tree surgery works must be scheduled by the PA and presented to the LPA for approval prior to commencement.
9. Ground plates to be installed where needed, approved and signed off by the PA.
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. If trench excavation is preferred, it must be carried out by hand, using hand tools only, taking care not to damage roots. This is only acceptable in some circumstances over short distances and where conditions are suitable. The air spade or air vac is the preferred option.
12. Roots above 50-mm diameter must be retained undamaged.
13. The use of an Air Spade is advisable and maybe requested by the PA where ground is difficult and when many roots are present. when using this method –

Services using Thrust Boring

14. The Client is to mark out the proposed route of the service runs clearly, using flu marker paint or other system, for inspection by the PA prior to any works commencing.
15. Service route to be located outside the RPA where possible.
16. PA to supervise the entire operation.
17. PA to provide toolbox talk to the engaged Contractors undertaking the works immediately prior to commencement of works.
18. Tree Protective Barrier Fencing to be offset just sufficiently for the works to be undertaken and immediately prior to the works.
19. The trees crowns and stem should be protected from possible collision damage and included within the area protected by the tree protective barrier fencing if possible. if not, tying back branches or pruning and stem protection may be necessary.
20. Install stem protection where necessary in accordance with Figure 1. PA to assess and advise.
21. Any proposed tree surgery works must be scheduled by the PA and presented to the LPA for approval prior to commencement.
22. Ground plates to be installed where needed, approved and signed off by the PA.
23. Contractor must carry a spill kit and deal with any oil or fuel leaks promptly and report them to the PA and Site Manager.
24. Type of installation method must be approved by the PA.
25. Location of launch and retrieval pits to be agreed with the PA which must be outside of any RPA.
26. Set-back in alignment of Tree Protective Barrier Fencing to be agreed and supervised by the PA.
27. Ground plates to be installed were needed, approved and signed off by the PA.
28. Works to be supervised by the PA and reported on through the watching brief process.
29. Realignment of fencing and removal of ground plates to the satisfaction of the PA.
30. Tree Protective Barrier Fencing to be repositioned in its correct location immediately upon completion of the works and to the satisfaction of the PA.
31. All the works must be to the full satisfaction of the Project Arborist and signed off under a Watching Brief Scheme with the LPA.
32. .

Table 3 Trenchless solutions for differing utility apparatus installation requirements

Method	Accuracy	Bore dia. ^{A)}	Max. sub. ^{B)} length	Applications	Not suitable for
	mm	mm	m		
Microtunnelling	<20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/ roadway undercrossings	Low-cost projects due to relative expense
Surface-launched directional drilling	≈100	25 to 1 200	150	Pressure pipes, cables including fibre optic	Gravity-fall pipes, e.g. drains and sewers ^{C)}
Pipe ramming	≈150	150 to 2 000	70	Any large-bore pipes and ducts	Rocky and other heavily obstructed soils
Impact moling ^{D)}	≈50 ^{E)}	30 to 180 ^{F)}	40	Gas, water and cable connections, e.g. from street to property	Any application that requires accuracy over distances in excess of 5 m

^{A)} Dependent on strata encountered.

^{B)} Maximum subterranean length.

^{C)} Pit-launched directional drilling can be used for gravity fall pipes up to 20 m subterranean length.

^{D)} Impact moling (also known as thrust-bore) generally requires soft, cohesive soils.

^{E)} Substantial inverse relationship between accuracy and distance.

^{F)} Figures given relate to single pass: up to 300 mm bore achievable with multiple passes.

NOTE.

The National Joint Utilities Guidance 4 (NJUG), which is a guide for utility companies when installing services, is not relevant under Planning Conditions and the more stringent protection measures under Section 7.7. of BS5837 Trees in relation to design, demolition and construction – Recommendations (2012), apply. Utility companies must be instructed accordingly and follow the aforementioned British Standard.

Infrastructure & Retaining Structures

Level Changes

There is notable level changes required on this site most notably to the eastern section of the development, hence the loss of several trees in this area, most notably T39 & G18. However, on production of the detailed levels plan albeit in draft form (Drawing Numbers: 19399_C-300_1-5. QuadConsult), there are no additional losses from those discussed during the early site meetings between NCC's Tree Officer, Redrow and the Project Arborist.

Retaining Structures

- Due to the sloping ground, there may be areas where retaining structures are required, however based on current plans there are no requirements for such structures within the Root Protection Area of any retained trees and so the following is a generic approach should retain structures be required.

Installing retaining structures within any Root Protection Area to facilitate changes in ground level would need to follow the same principles shown in Specialists Foundations below, to negate the adverse effect strip foundations have on tree roots. In addition, where levels are being raised above existing RPA's or where future tree root growth may be affected by the raising in ground levels then allowance should be made for the respiration of tree roots which require an exchange of gaseous between the soil and atmosphere. This can be achieved using bespoke design of a venting system to suit the situation and should be agreed with the

Project Arborist and other relevant academics where necessary. The basic elements of this design are likely to include a clean stone envelope and venting pipes between the existing and new levels.

Extreme care will be required when designing and constructing any retaining structures within a Root Protection Area. There will be a need for consultation between the Engineers and Project Arborist at the design stage and supervision of such construction. When assessing any work within a Root Protection Area the Tree Survey & Tree Constraints Plan for a site will need to be used as an overlay during the design and consultation process to accurately assess the potentially significant constraints posed by trees in such a location.

As the ground level / engineering plans are in draft format, any changes to the ground level plans and proposed retaining structures should they occur near trees, will require consultation with the Project Arborist beforehand, and may require written approval via the Local Planning Authority, if they infringe upon any Root Protection Areas.

Generic Specialist Engineering for Foundations within the Root Protection Area.

- **There are no strip foundations proposed within the Root Protection Area of any retained tree and the following would only apply if this changed: -**

The use of traditional strip footings can result in extensive root loss and should be avoided. The insertion of specially engineered structures within RPAs may be justified if this enables the retention of a good quality tree that would otherwise be lost (usually categories A or B).

Designs for footings that would minimize adverse impact on trees should include particular attention to existing levels, proposed finished levels and cross-sectional details. To arrive at a suitable solution, site-specific and specialist advice regarding design should be sought from an engineer and assessed by the project arboriculturist in relation to tree health. In shrinkable soils, the foundation design should take account of the risk of indirect damage.

Light structures can be disrupted by tree roots through cell turgor pressure and through the secondary thickening process of tree stems. This requires consideration when placing such structures near trees. Refer to Table A1, found later in this Report in Section Impact Assessment of Development on Trees. The use of root barrier proprietary products such as ReRoot (Green Blue Urban Products) may be required.

Root damage can be minimized by using:

- Piles, with site investigation used to determine their optimal location whilst avoiding damage to roots important for the stability of the tree, by means of hand tools or compressed air soil displacement, to a minimum depth of 600 mm.
- Beams/lintels, laid at or above ground level, and cantilevered as necessary to avoid tree roots identified by site investigation.

Whilst alternative solutions should be found wherever possible, it is in principle plausible to build above the RPA of a retained tree providing it can be achieved with no digging. This is often possible using a raft concrete slab or the use of stone gabions etc, positioned above the existing ground levels and can be implemented with no digging, scrapping, compacting or pollution of the soil. Such designs must include consultation with the Project Arborist. The availability of water for trees or where a structure retains or diverts water requires consideration to avoid issues in relation to soil erosion, waterlogging, reduced water availability or pollution.

The following Arboricultural Method Statement principals will apply and must be undertaken with the supervision of the Project Arborist. This may be amended to suit specific operations.

METHOD STATEMENT

- 1) Construction should ideally be undertaken when the ground is driest and least prone to compaction.
- 2) Kill ground vegetation using a translocated herbicide such as glyphosate⁵. After some time, gather up the dead organic material to prevent the build-up of anaerobic conditions beneath the construction, which might otherwise occur as vegetation begins to decompose.
- 3) Take care when constructing not to compact the soil or cause root damage. There must not be any vehicle or plant movement within the Root Protection Area. If work cannot be carried out from outside the RPA then the ground must be protected by 'load spreaders' along the construction length and breadth.
- 4) Remove major protrusions such as rocks and tree or shrub stumps (stumps should be ground out rather than excavated to minimise soil disturbance).
- 5) Fill major hollows with sharp lime/salt free sand. DO NOT GRADE-OFF HIGH SPOTS
- 6) Lay an impermeable membrane over the base area prior to pouring of concrete to prevent leachate.
- 7) Secure any shuttering using long pins driven into the ground through the membrane. 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.

Drainage Ditches & Swales

The positioning of swales is on occasion close to Root Protection Areas, but do not infringe upon them. On Plan Extract 7f (cross section T6), it shows an infringement into the theoretical Root Protection Area of Tree 32, a mature Lawson cypress (*Chamaecyparis lawsoniana*). However, the infringement does not exist as the west side of the Root Protection Area would be curtailed by the existing buildings and hardstanding, with an elevated ground level change.

The trees near the swales are in maturity and unlikely to significantly increase in size and therefore their rooting area demand should not significantly increase either. The design layout in this area reflects the previous footprint and therefore the developed area remains very similar. They all have a good unaffected rooting area with potential for expansion if required, to all other cardinal points away from the swales, and in the case of T116 (cross section T13), the main rooting area is located primarily within an existing garden of an adjoining house with its rooting potential limited to the east by the Public Right of Way and existing site infrastructure. The swales may well intercept excessive water run-off, however they are designed to allow this water to permeate through the soil in a controlled manner and the trees being downslope of them, should still benefit from unaffected water supplies. The trees in themselves are extremely adept at increasing soil permeability and of course utilise significant water volumes.

The remaining cross sections are in locations away from swales and indicate no obvious ground level changes in relation to trees and are not considered any further.

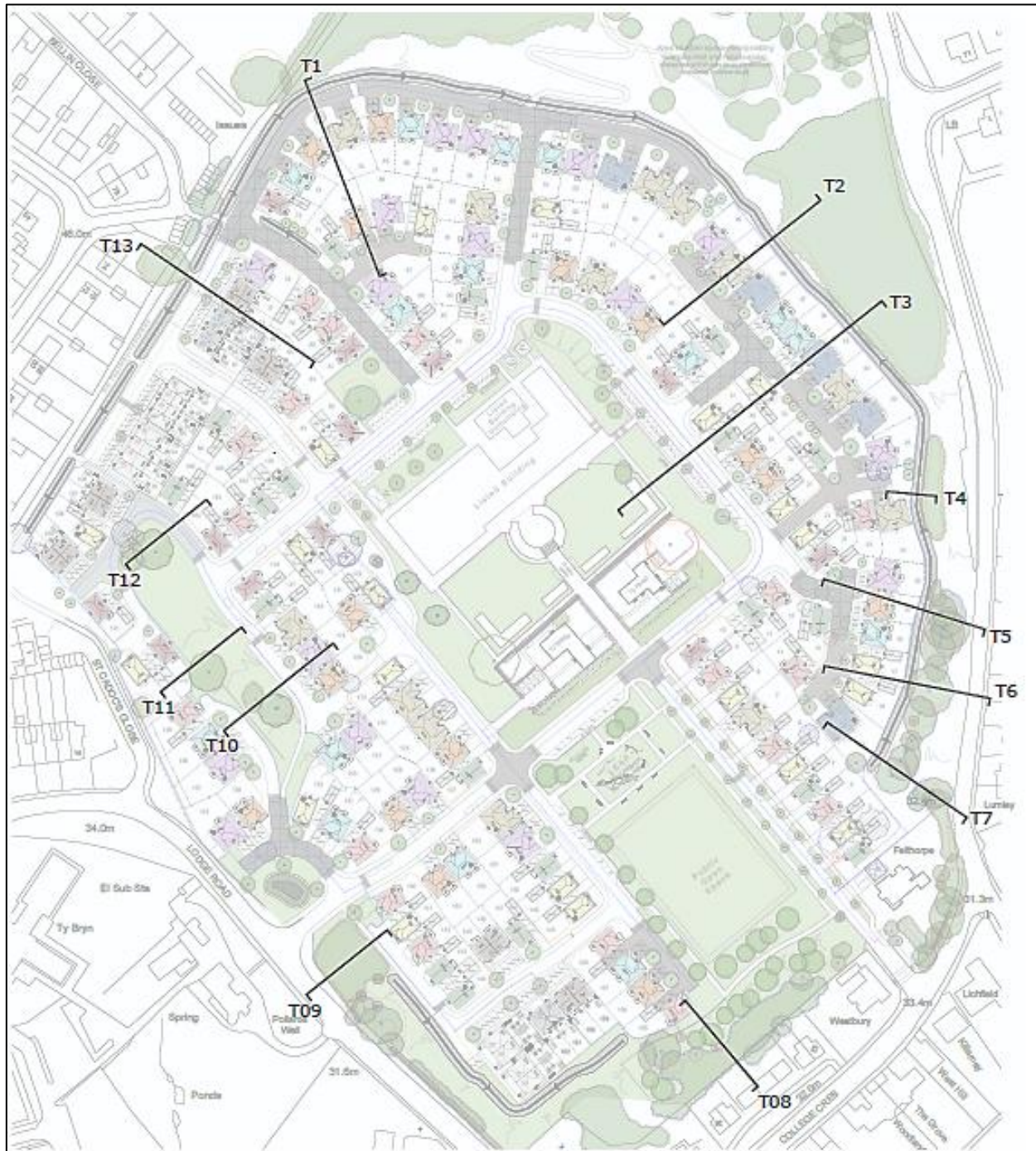
NOTE. The dimensions of the crown spread, and Root Protection Area shown within cross-section drawings are taken from the Tree Survey¹, whereas the tree and group graphics are indicative and can on occasion be misleading i.e. Cross section T3 shows the stems of Group 21 extending beyond its own Root Protection Area, towards the swale, which is not accurate. On the coloured overview plan below, the relevant sections in relation to trees and swales are – Cross sections T1 – T4, T5, T6, T7 & T13 (please note the prefix T and numbers do not relate to individual tree numbers within the Tree Protection Plan).

The relevant cross-sectional plans depicting swales near trees, are shown below.

⁵ Pesticides can be dangerous...refer to manufactures instructions and follow the advice on the label carefully. Pesticides should only be used by competent personnel.

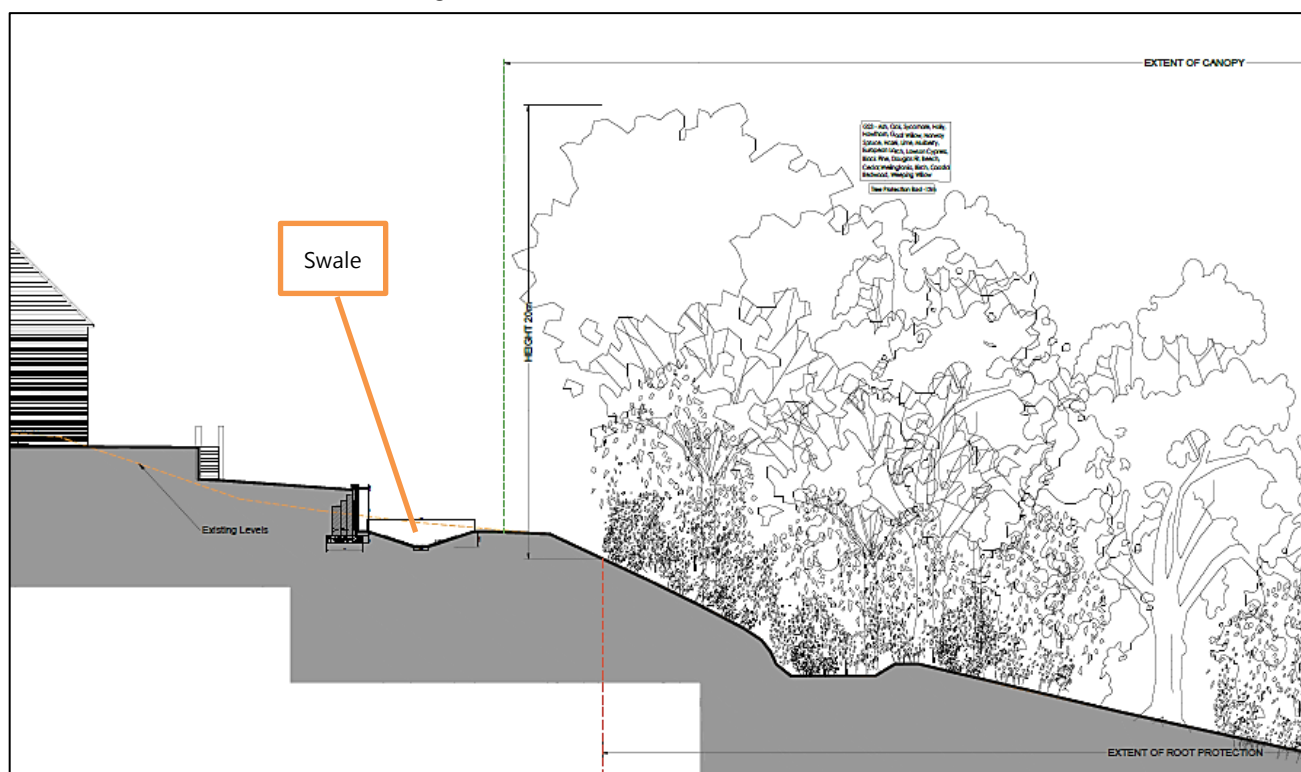
Arboricultural Implications Assessment & Arboricultural Method Statement
at Caerleon Former University Campus. Dated January 2025. (Revision 4)

Engineering Cross Sections Plan

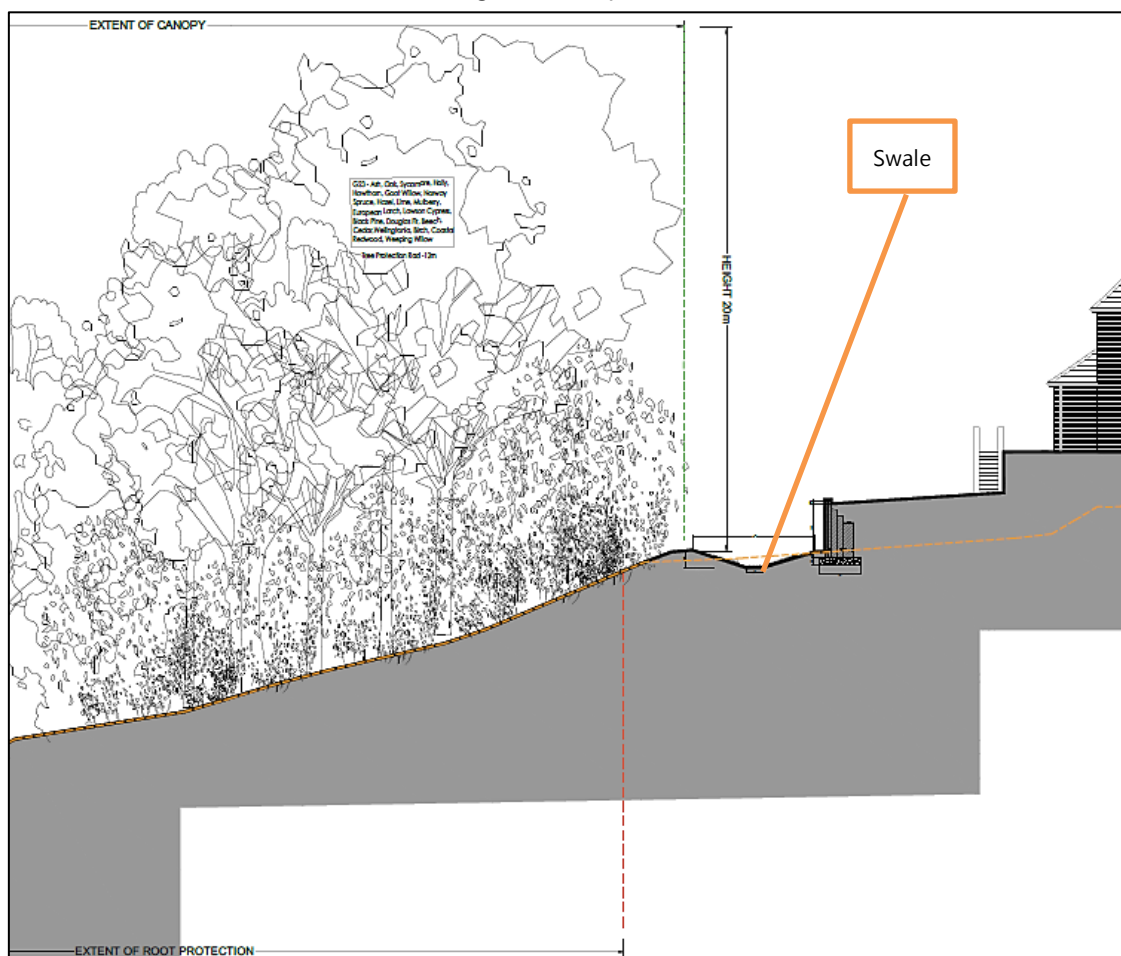


Arboricultural Implications Assessment & Arboricultural Method Statement
at Caerleon Former University Campus. Dated January 2025. (Revision 4)

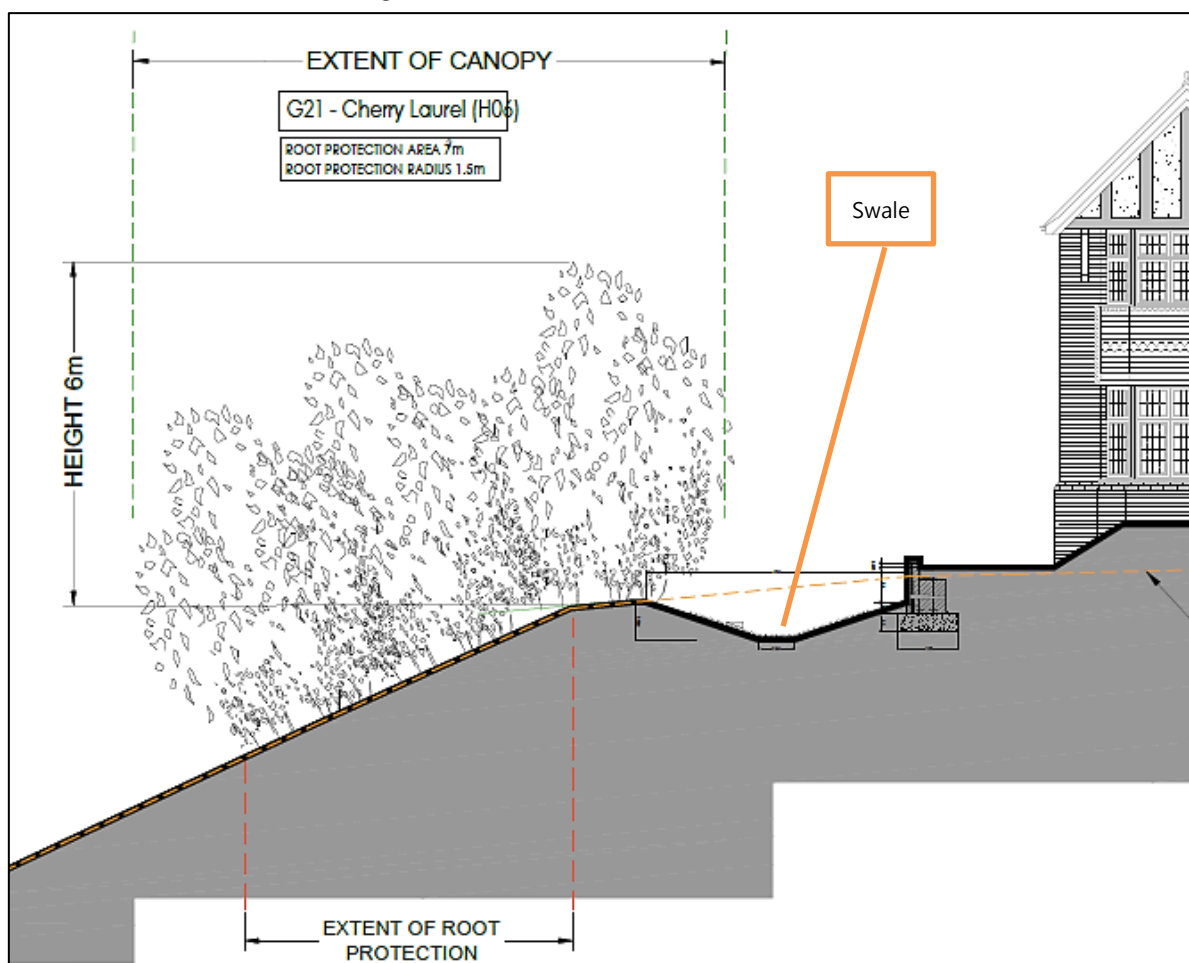
Plan Extract 7a. Section T1 - Swale abutting south-west of G23.



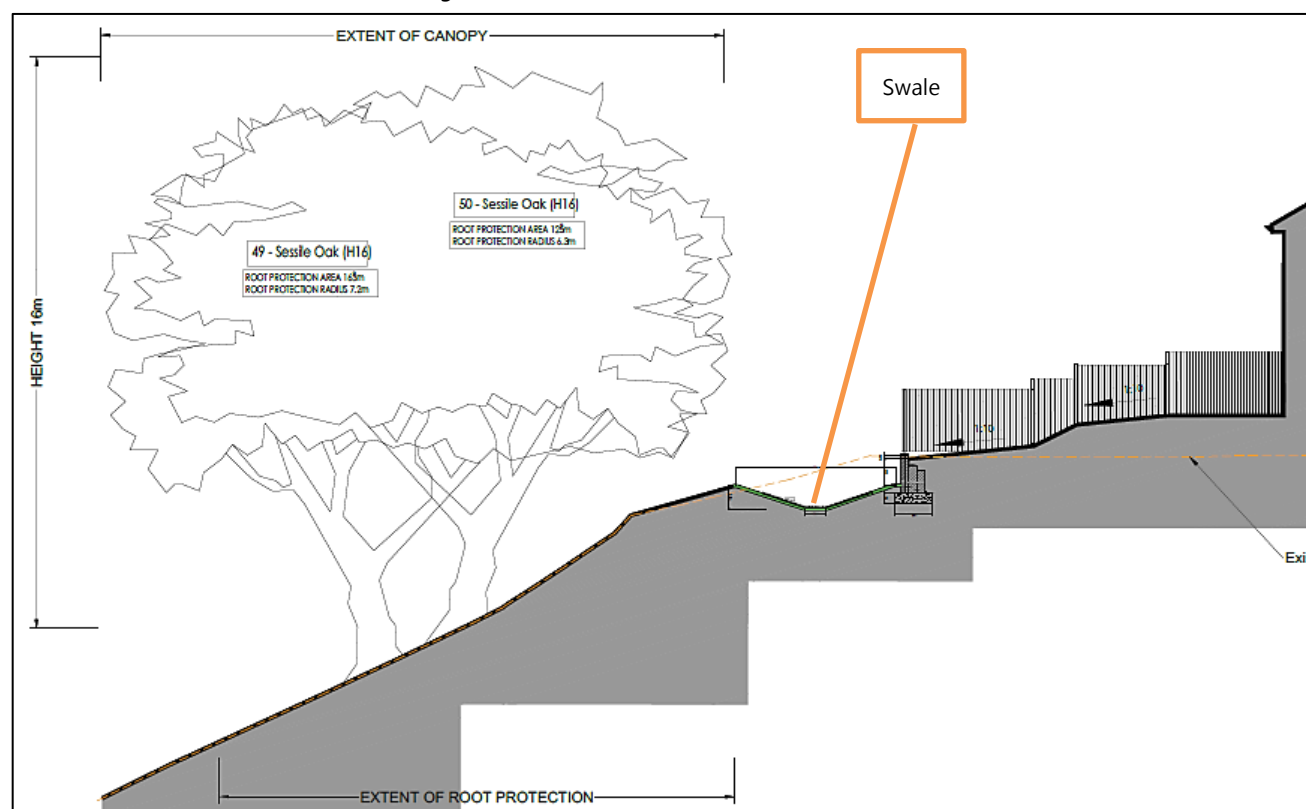
Plan Extract 7b. Section T2 - Section T2 - Swale abutting southern tip to west of G23.



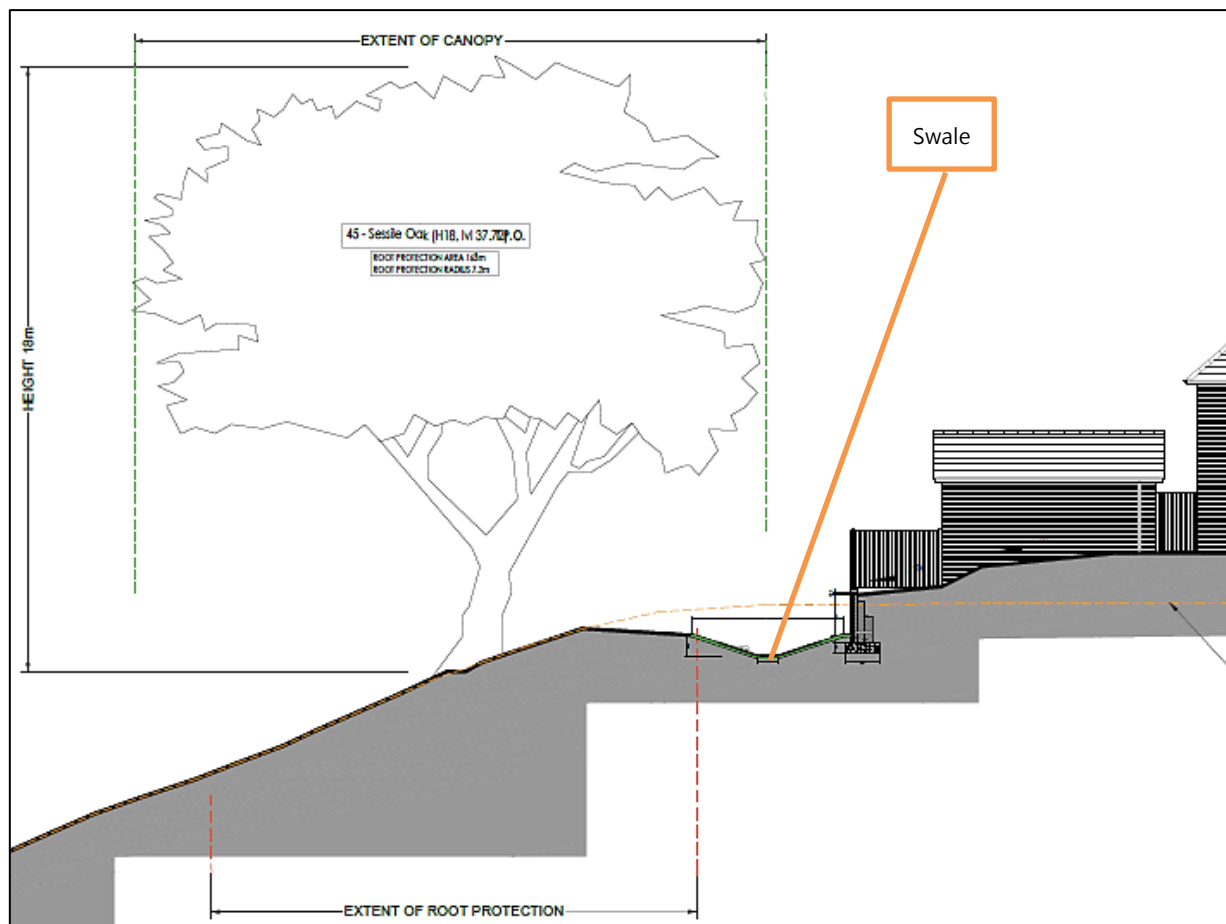
Plan Extract 7c. Section T3 - Swale abutting west of G21.



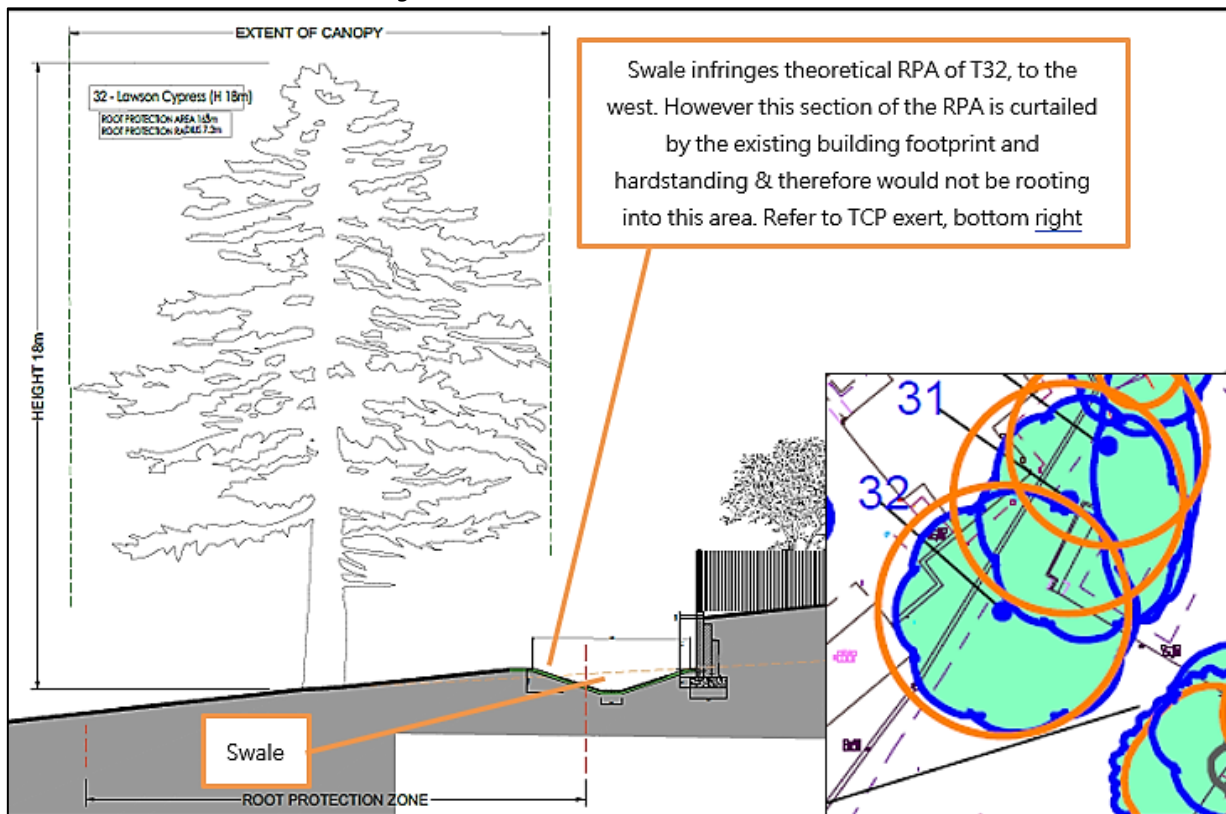
Plan Extract 7d. Section T4 - Swale abutting west of Tree 49 & 50.



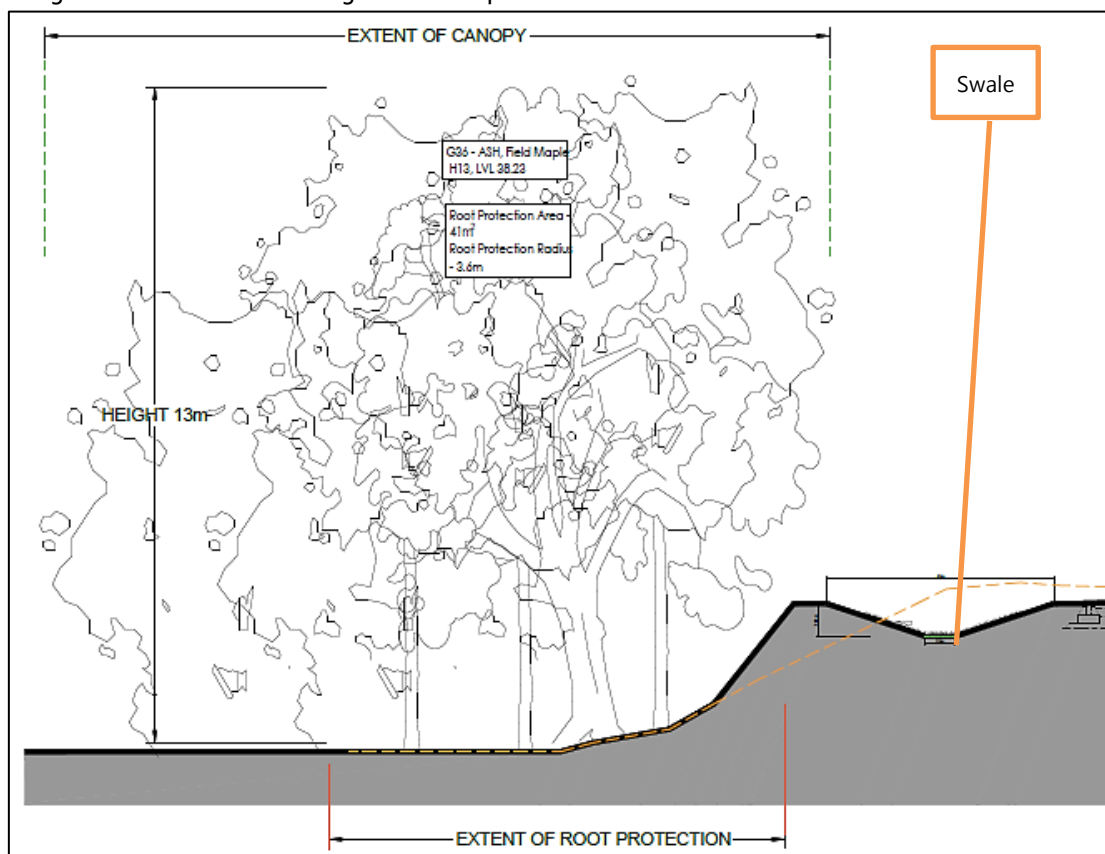
Plan Extract 7e. Section T5 - Swale abutting west of Tree 45.



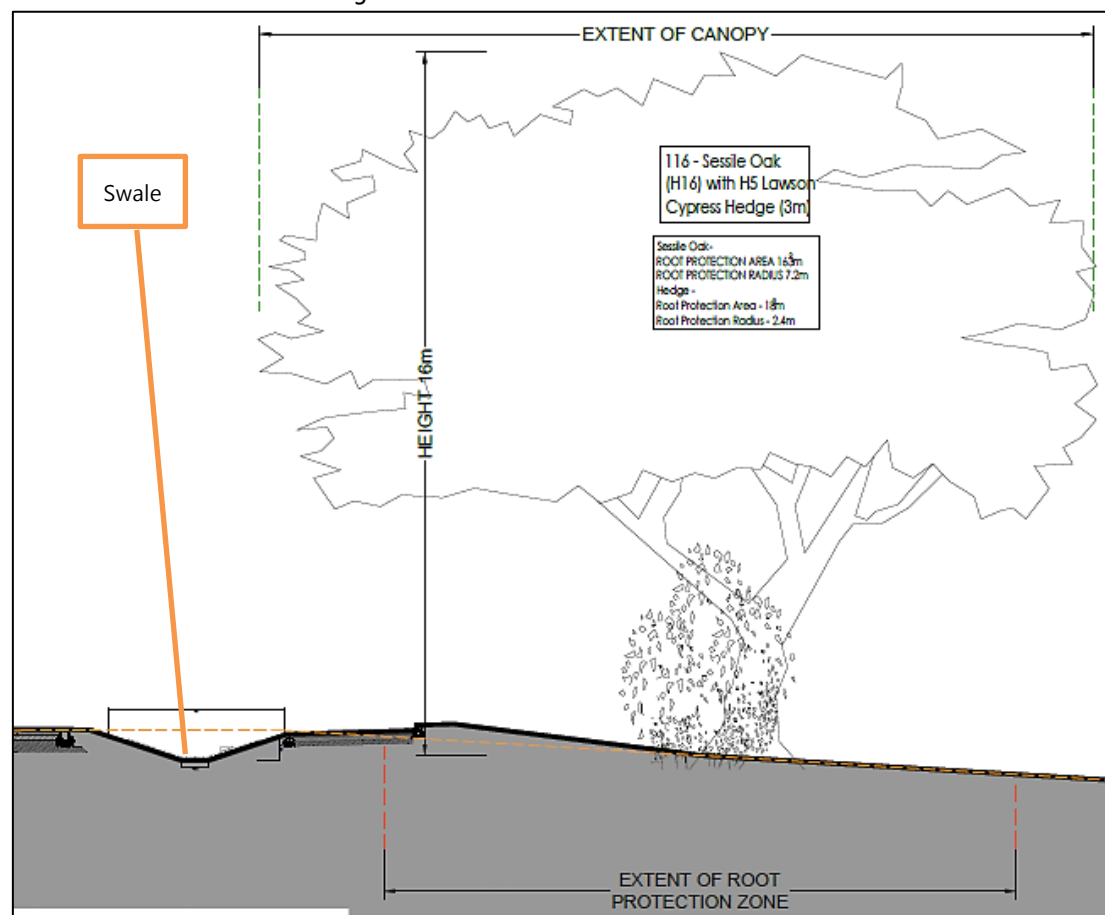
Plan Extract 7f. Section T6 - Swale abutting west of Tree 32.



Plan Extract 7g. Section T7 - Swale abutting east of Group 36.



Plan Extract 7h. Section T13 - Swale abutting east of Tree 116.



Arboricultural Method Statement – Swales.

Where swales are near trees but do not infringe as indicated in Plan Extracts 7a – 7h above, the Tree Protection Fencing must remain in-situ and not be moved back for operational purposes.

The proposed swale route and width should be marked out on-site to guide the position of the swale and to ensure it does not infringe upon the Root Protection Area. The Project Arborist should review this once marked out on site.

The Project Arborist will supervise any access facilitation pruning of crowns, that will likely be required for: -

- Group 21 – side prune west side of the Cherry laurel (*Prunus laurocerasus*) hedge, using a hedge-cutter or box prune if preferred.
- Tree 45 – tip back low hanging branches to the west only to facilitate access for machinery.
- Tree 32 - crown lift in all directions to facilitate access to the west side.

Use a mini digger near trees 32 & 45 to minimise the requirement for pruning.

Pruning must be kept to a minimum, keeping wounds as small as possible i.e. removing secondary branches only, where possible. Limbs will not be removed, and localised hand digging must be the alternative in such scenarios.

The swales should be constructed with the use of the smallest practical machinery, working on the site side away from the trees or by working back on themselves along the line of the swale ensuring the machinery's wheelbase does not enter the Root Protection Area. Where this cannot be achieved then the use of load bearing track mats must be used and approved by the Project Arborist, prior to usage.

The Project Arborist will supervise the temporary setting back of the tree protection fencing.

There must be no storage of materials, spoil or machinery etc. within the Root Protection Area of trees, during these operations.

Arboricultural Method Statement - Services.

33. The Client is to mark out the proposed route of the service runs clearly, using flu marker paint or other system, for inspection by the PA prior to any works commencing.
34. Service route to be located outside the RPA where possible.
35. PA to supervise the entire operation.
36. PA to provide toolbox talk to the engaged Contractors undertaking the works immediately prior to commencement of works.
37. Tree Protective Barrier Fencing to be offset just sufficiently for the works to be undertaken and immediately prior to the works.
38. The trees crowns should be protected from possible collision damage and included within the area protected by the tree protective barrier fencing. If not possible, tie back branches if possible. or schedule tree pruning for approval by the LPA
39. Ground plates to be installed where needed, approved and signed off by the PA.
40. Install stem protection where necessary in accordance with Figure 1. PA to assess and advise.
41. Any proposed tree surgery works must be scheduled by the PA and presented to the LPA for approval prior to commencement.
42. Contractor must carry a spill kit and deal with any oil or fuel leaks promptly and report them to the PA and Site Manager.
43. Trench is to be excavated by hand, using hand tools only.
44. Roots above 50-mm diameter must be retained undamaged.
45. The use of an Air Spade is advisable and maybe requested by the PA where ground is difficult and when many roots are present.
46. Exposed roots must be covered with damp hessian once exposed, to prevent drying.
47. Smaller broken roots should be pruned with a clean-cut, using secateurs.
48. Following insertion of the services beneath the retained roots, the trench should be backfilled with clean, friable, sandy soil. Compacting by foot in layers of 100-mm.
49. Tree Protective Barrier Fencing to be repositioned in its correct location immediately upon completion of the works and to the satisfaction of the PA.
50. All the works must be to the full satisfaction of the Project Arborist and signed off under a Watching Brief Scheme with the LPA.

Cycle-path / Public Right of Way

An upgrade in part (from Saint Cadoc' s Close to Bellin Close) of the existing Public Right of Way will see the footpath/cycle-path created at a width of 3-m which will involve a widening of the existing. Trees within influencing distance of this path include those on-site and adjoining the site (primarily T116 and possibly T117). An upgraded / new footpath is noted within G23 as per the Landscape plan (EDP 5061), extract below: -

Plan Extract 8. Orange solid line - Upgrade & new path network within G23.



The upgrade should be of a no dig tree friendly construction ideally utilising the existing surface as a sub-base (refer to Arboricultural Method Statement – Footpath/Cycle-path below).

Arboricultural Method Statement – Footpaths & Cycle-path

Laying of footpaths and cycle-paths across or through RPA' s is particularly damaging to trees.

In the case of the path proposed within G23, the detailed Tree Survey⁶ for its north-east section should be used to define constraints. The Tree Constraints Plan for this specific section can also be found in the Appendices.

Tree friendly construction techniques are acceptable providing the existing ground levels are not lowered and the following design principals and working method are engaged. The detailed specifications should involve consultation with the Project Arborist to devise a specific Arboricultural Method Statement. However, the following principals will apply: -

Design Recommendations

1. The design recommendations 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 path /cycle-path width.

⁶ Caerleon Uni_G23_BS5837 Tree Survey_TCP_August 202. S. Ambler

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. 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.
5. 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.
6. 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 future growth and movement. Resulting gaps may be filled using appropriate inert granular material.

NOTE- Appropriate sub-base options for this type of new hard surfacing include two-dimensional load suspension systems. Alternatively, elevated beams etc. can be used to support surfaces to bridge over the RPA or, following exploratory investigations to determine location, to provide support within the RPA while allowing the retention of roots greater than 25-mm in diameter.

7. When designing the hard surface, account should be taken of finished levels in relation to adjacent structures, including existing paths crossovers and end links with roads.
8. 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).
9. 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 using 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 greater 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.

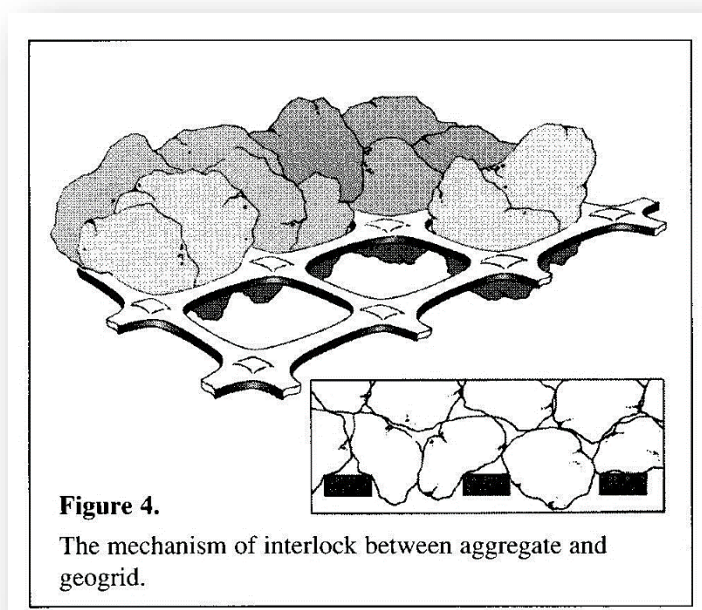
10. The soil structure including the area beneath the proposed new hard surface and adjoining it should be protected from compaction during installation. This may be achieved by; a) the use of temporary ground protection to safeguard the working area; b) constructing the new surface with machinery working forward from the surface as it is constructed (known as "rolling out").
11. 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.

12. Raising levels should be achieved by use of a granular material which remains gas- and water-permeable throughout its design life.
13. 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.
14. New permanent hard surfacing should not exceed 20% of existing unsurfaced ground within the RPA

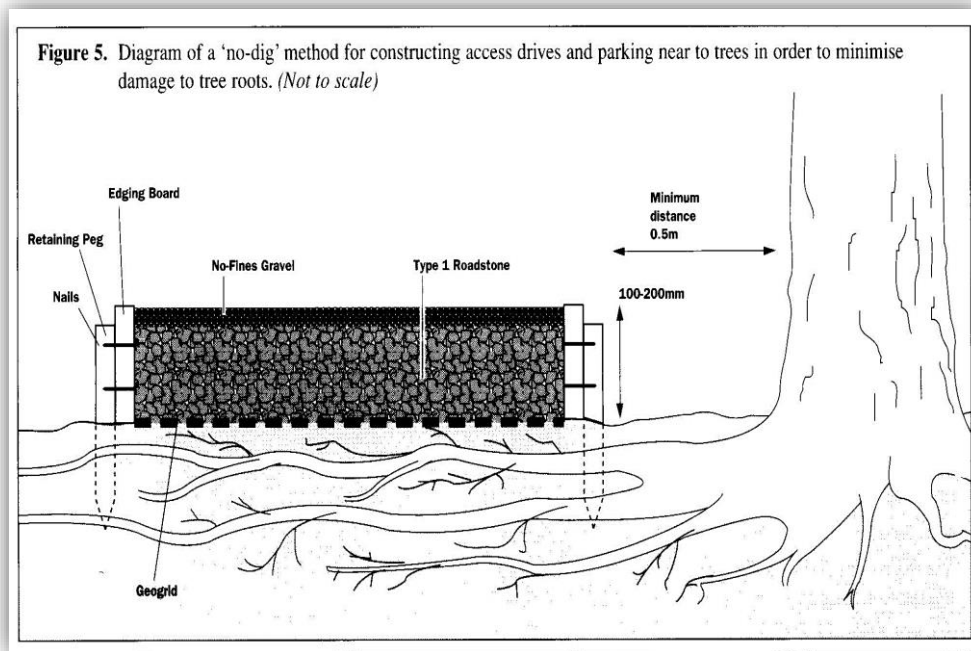
NOTE 5- a **geotextile**, which is usually used to prevent layers of different materials mixing while allowing water to pass through, is not designed to be load bearing. 'Load Spreading' materials are synthetic grids or webs designed to support paths/cycle-paths or roads on soft ground by distributing the load over a larger area than would normally occur. Such load spreading materials may be two or three dimensional. Here two-dimensional grids are deemed acceptable

15. 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 (refer to 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.



16. 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.
17. An example of a no dig path construction is offered in Figure 5.

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 arboriculturalist.



Method for Constructing Access within RPA

- 1) Kill ground vegetation using a translocated herbicide such as glyphosate⁷. 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.
 - 2) Construction should ideally be undertaken between May and October when the ground is driest and least prone to compaction.
 - 3) 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 sub-base. Then movement must only be along the line of construction.
 - 4) Begin construction at the entrance to the site and 'roll-out' the path in front of the machinery which always remains over the sub-base.
 - 5) Remove major protrusions such as rocks and tree or shrub stumps (stumps should be ground out rather than excavated to minimise soil disturbance).
 - 6) Fill major hollows with sharp sand. DO NOT GRADE-OFF HIGH SPOTS
 - 7) If necessary, for example when using two-dimensional grid, as a 'load spreader', a geotextile should be laid underneath and over the no fines sub-base.
 - 8) 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.
- 9) 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. Refer to NOTE above.
 - 10) 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.

⁷ Pesticides can be dangerous...refer to manufactures instructions and follow the advice on the label carefully. Pesticides should only be used by competent personnel.

- 11) Compact the sub-base to ensure binding with the geogrid and to minimise future rutting.
- 12) A further geotextile may be placed over the sub-base to prevent dry bedding materials or surfacing merging with the subbase.
- 13) 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.

Vision Splays

- No trees are to be removed to achieve necessary vision splays under the current scheme.

Signage and CCTV

- CCTV and signage are unlikely to be required and is not proposed as part of this scheme.

WHETHER DESIGN CAN BE MODIFIED TO ACCOMMODATE TREE RETENTION

The site layout has involved on-going consultations and site meetings between the developer, Local Planning Authority representatives and the Project Arborist to ensure tree losses are minimised and to ensure that all the A rated trees and a significant proportion of the B category trees are retained.

There are a few specific minor design modifications in relation to certain conflicts between trees and the development generally around retaining structures or swales and these are detailed elsewhere within the Report. Many of the original conflicts have been removed through 3 previous AIA assessments and redesign.

There will almost certainly be a requirement for consultation with a Project Arborist in relation to forthcoming detailed designs for the retaining structures, footpath/cycle-path, services, and swales which should occur early in the process.

WHETHER TREE LOSSES FROM THE DEVELOPMENT PROPOSAL CAN BE MITIGATED

Tree losses occurring as a direct result of this scheme are detailed on the Tree Protection Plan with Tree Retention / Removal in the Appendices. Mitigation is offered in the following forms and detailed within the Landscape Plans - edp5601_d025-AB-Detailed Soft Landscape Plan and - edp5601_d031-Y-Detailed Soft Landscape Design with Plot Planting

Translocation of Trees.

The use of tree spade was considered for moving several semi-mature trees but due to access limitations, the anticipated root loss given their position in hard landscaped areas and a cost analysis with new planting the latter was favoured. As such a significant planting programme will be occurring most notably within G23 in mitigation of these losses.

Several smaller ornamental trees and shrubs are proposed for removal and includes: 1 x Persian ironwood (*Parrotia persica*), 4 x *Magnolia grandiflora* and a small glade of young Japanese maple (*Acer palmatum*).

As certain trees on site are likely to pose a significant constraint to development, there is scope on this site to undertake mitigation planting particularly along the somewhat open north-east boundary abutting the Public Right of Way and within the woodland / parkland grouping of G23, thereby improving habitat connectivity.

Group 23 would also benefit from a wider management plan to consider tree condition, access facilities, interpretation and woodland management. The tree condition survey element is due to be undertaken in Autumn 2020 by Steve Ambler & Sons Tree Specialists Ltd.

Some of the proposed landscaping activities will need to be undertaken in accordance with the generic Arboricultural Method Statement detailed below: -

Generic Arboricultural Method Statement – Landscaping.

Estate fencing (close board timber fencing) is often located on the far side of swales potentially near tree groups when viewed on plans. However, the swales occur on the top of banks with the trees falling away, and the fencing located often on the top of existing retaining structures. Therefore, these ground level changes will protect the trees.

- However, should pinch points occur i.e. near plots 15-20, on-site measurements should be taken by the Project Arborist to ascertain if a conflict exists, to alleviate any issues. Given these level changes, the risk is deemed low.

Fencing

The erection of fencing within a Root Protection Area 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, non 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.

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 Mattheck⁸ 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 Root Protection Area. The MERR of any tree directly correlates to its trunk diameter when measured just above the root buttress flare. Such measurements will need to be undertaken by the Project Arborist and marked out on site to define the route of the fencing.

Excavations for post holes should not occur within the MERR or exceed 200-mm in diameter, be cut cleanly with a posthole borer and must be carefully positioned. They should not be spaced any closer than 1 metre apart when working within the RPA. Where feasible (subject to the fencing specification) panels or section should be shortened or elongated as required, to avoid post holes and the damage to structural roots.

Method Statement Fencing

If working in the MERR is unavoidable, it may only proceed using hand tools and under the supervision of the Project Arborist and the agreement of the Local Planning Authority 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.

A posthole auger will be necessary to drive the postholes, and care should be taken when using any mechanical driven rig within the Root Protection Area.

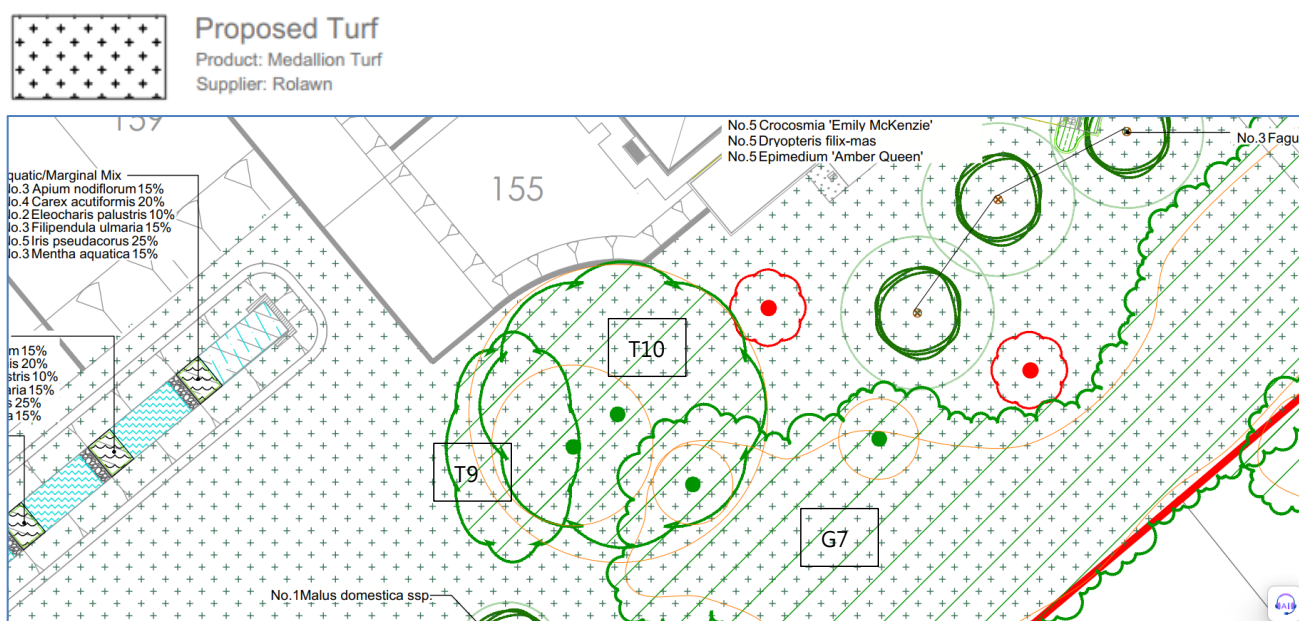
- 1) The auger operation should limit the diameter of the holes to 200-mm or below, with a minimum distance between the edge of each pile of 1000-mm where possible.

⁸ Mattheck. C. & Breloer. H. The Body Language of Trees. A Handbook for Failure Analysis

- 2) 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.
- 3) The tree protection fencing should be temporarily moved to accommodate the works immediately prior to the operation and reinstated immediately upon completion of the operation where it applies.
- 4) Where using a rig, the auger operation should be carried out whilst on top of 'load spreaders' (track mats) 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.
- 5) Consider the height of the Rig to prevent damage to overhanging branches.
- 6) The augured excavated material shall be collected carefully and removed from the RPA
- 7) Take precautions to prevent soil contamination, which may involve using a non-permeable sheet below the rig during its operation to prevent leaking fuel and hydraulic oil onto the soil.
- 8) 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
- 9) Apply concrete to 'non-permeable sleeved' augured holes to prevent leachates entering the soil and great care shall be taken not to spill and contaminate the soil.
- 10) The Project Arborist shall be informed of the dates of these operation to supervise the activities when they occur near trees.

Landscaping

Turfing and wildflower seeding is proposed within the Root Protection Area of trees T9, T10 and G7, and this is damaging to tree health due to the raising of existing levels (turfing) and the ground preparation works required. Turfing should be avoided in favour of seeding operations or more beneficial, changed for well composted mulches to reduce competition and improve the rooting environment. Obviously, the use of mulch may not be visually acceptable in more formally landscaped locations in which case seeding is the more favoured option.



Where grass seeding is proposed within a Root Protection Area, the following method statement must be followed -

Method Statement Grass Seeding

1. Levels should not be altered.
2. Any existing ground vegetation should be killed using an appropriate herbicide.
3. Dead vegetation may be raked or strimmed off using hand tools.
4. Apply a fine layer of sandy compost if required but not exceeding 50-mm depth.
5. Seed may be laid directly onto this.
6. Care must be taken to avoid compaction so ideally done during dryish conditions avoiding working on wet and saturated soils.
7. The use of fertilisers must be avoided.
8. Exposed ground within the RPA must be protected where wheelbarrows or mechanical barrows or small plant is used, working off load spreaders that are suitable to support and distribute the load.
9. Any works within the RPA must be supervised by the Project Arborist.

NOTE - The RPAs of retained trees should be excluded from landscaping where possible. Top soiling over and above the root-plate of tree' s is detrimental to their health even just 100-mm or so and where turf is added. Planting into the RPA is also damaging to roots.

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.

NOTE - Soft landscape finishes including mulch and cultivated beds will generally provide more favourable conditions for young tree establishment than most hard surfaces or highly competitive 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. The positioning of the Tree Protection Fencing (Appendices) on the Tree Protection Plan with Tree Retention / Removal often incorporates proposed planting areas beyond the retained trees, it does not however show protection for areas of new planting away from existing trees.

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 depth). 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

- 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.
- 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 sp
- Further guidance on mulching is given in BS3998 Tree Works – Recommendations (2010).

IMPACT ASSESSMENT OF DEVELOPMENT ON TREES.

A realistic assessment of the probable impact of the proposed development on the trees and vice versa with due allowances for their future growth and maintenance requirements.

Many of the trees are at or nearing maturity, so their future growth is not seen as an issue. The wooded groups would benefit from a long-term management plan.

The key 'A' rated trees on site have limited changes around them due to their location off site, near buildings that are due for retention, or their position remains within public open spaces. The exception are trees 89, 89, 92, 101 and 102, which will be near demolition operations which will require care and monitoring by the Project Arborist.

Steve Ambler & Sons Tree Specialists Ltd have been appointed to undertake a tree condition survey in the Autumn of 2020, within Group 23, due to its proposed increased usage as an informal open space and its location near a busy road.

Any potential damage to the proposed buildings as a consequence of the trees would consider (a) indirect damage through subsidence or heave (a matter related to geology), (b) Direct damage, physical damage caused by incremental growth, (c) The disruption to underground services, (d) Displacement, lifting or distortion, (e) The impact on branches on the super structure or (f) Structural failure of a tree.

The houses are often set back from the trees which are located beyond gardens with a linear buffer usually where the swales are positioned. One area where trees may come under pressure due to shading issues is immediately south of 'Felthorpe' Lodge. Whilst the broadleaved trees in this area are mature and highly visible on the entrance, there is perhaps scope to consider the removal of the Group 10 (EM/M, 'C' category) which is a row of evergreen conifers (Lawson cypress (*Chamaecyparis lawsoniana*) which may come under pressure where residents could invoke assessments under the High Hedges Regulations (Anti – Social Behaviour Act 2014).

- a) **Indirect Damage.** The likelihood of damage occurring to the structure because of ground movement occurring through soil swelling and shrinking is dependent on local geological conditions and the presence of shrinkable clay soils beneath the foundations. This report has not considered the soil type in any detail or undertaken a laboratory soil analysis as part of this brief. The potential for direct damage should be taken into consideration throughout the design and construction process. For guidance on avoiding indirect damage by trees to structures, refer to NHBC Chapter 4.2.
- b) **Direct Damage.** This can sometimes occur through the annual incremental growth of the trunk or root buttresses through a process called 'secondary thickening'. The greatest risk of direct damage occurs when trees are close to building structures and occur with the expanding growth of the main trunk and roots although any likelihood of such damage diminishes rapidly with distance. Table A.1 of BS:5837 is produced below and provides advice on minimum distances to avoid damage. This is not deemed likely to be an issue as the layout allows space for retained trees but is possibly relevant when designing retention structures and estate fencing.
- c) **Displacement, lifting or distortion.** This can occur where lightweight structures are within influencing distance of trees and annual incremental growth of roots and buttresses could disturb paving, walls, porches, and garages. Advice in Table A1 should be followed (see below) when planting new trees or controlling seedling growth. This is not deemed likely to be an issue as the layout allows space for retained trees and newly planted ones.
- d) **The impact of branches on the super structure.** Where development occurs close to trees and branches interfere or can interfere later due to their growth, can cause the LPA problems with repeated requests for trees to be trimmed. Here, the development appears to be mainly of sufficient distance away from any retained trees. Furthermore, woodland management operations will be required regularly and during these operations, problematic trees may be selected for removal to address any minor issues. This is not deemed likely to be an issue as the layout allows space for retained trees. The only trees in proximity would be trees near existing buildings due for retention, namely T53, T60 and those near Felthorpe Lodge. Conversely the privacy screening they provide may be welcomed by resident/s.
- e) **Wind Dynamics.** As far as wind dynamics are concerned, the following matters are noted. Air deflected over or around such solid structures will be locally accelerated to create turbulence. The proposed development is within influencing distance of the trees as buildings or solid structures can influence leeward wind patterns for a distance more than 30 times their height⁹, although the effects of the more damaging wind turbulence in respect of trees is much shorter than this with the more dramatic influence being at least twice the height of the structure. It is usually a problem where retained trees have thin stems without adequate stem taper, and which have usually resulted where they have developed at close spacing's and under mass shelter and particularly where a number of those trees have been removed. This is not deemed likely to be a significant issue as the layout allows space for retained trees and new housing is often replacing existing built structures. The only exception may be trees 89, 89, 92, 101 and 102 which have in the last 25 or so years been afforded protection from the elements by the three storey residential flats due for demolition and will now occur within an open

⁹ Patch.D. Trees, Shelter and Energy Conservation. Arboricultural Research and Information Note 145/ARB/98

space. As with the remainder of this site annual tree condition inspections are advised and any safety issues should be identified with recommendations actioned under the given priority rating (this also relates to point F below).

- f) **Large trees can sometimes cause apprehension to occupiers of nearby buildings especially during windy weather.** Whilst this is true in some instances, structural failure amongst trees is most common where a specimen is diseased or structurally defective or a stand is undermanaged. Well managed trees offer little risk to residences where under routine arboricultural inspections and providing any remedial works recommended during such an inspection are carried out by a competent tree surgeon.

The current site designation will afford tree protection for many trees, under statute law and all perspective purchases will be advised of any TPO's through the Land Search process. The LPA can consider applying further TPO's at any time where trees are considered under threat.

The level of risk exposure (target occupancy) for these trees will increase and impose a ¹⁰duty upon landowners to manage the trees. However, this is a reasonable expectation of any perspective landowner and should not be seen as detrimental to the health or long- term future of the trees or to the outcome of the application. Appropriate tree management under the guidance of an Arboriculturalist should be beneficial; it may however suggest that management is required from time to time which up until now has been somewhat neglected certainly in recent years.

- g) **Leaves and fruits of some species may cause problems,** and the accumulation of honeydew may be damaging to surfaces and vehicles. Here, the species of lime is noted which is associated with aphid activity and the production of honeydew excretions, although situated within the wooded area to the west and not in proximity to car parking facilities. Falling leaves are likely to impact on this development and Gutter Guards should be built into the scheme to prevent gutters from becoming blocked. There are no species found on this site that produce large fruits. Tree 59 (Lime sp) is perhaps the only potential issue in the future, in respect of honeydew production by aphids. But as it's an A rated tree and in maturity, it may not become an issue as its crown does not yet overhang the proposed car parking bays for the retained TJ Webley building.
- h) **The relationship of windows to trees which may obstruct light need to be considered.** Plots 15-20, 81, 155, 112, Felthorpe Lodge, are likely to be devoid of morning and/or midday sun due to their juxtaposition to trees albeit deciduous species. The exception is Group 10 by Felthorpe Lodge as discussed previously which may also cause shading in the afternoon and evening.

¹⁰ Failure Criteria for Solitary non-decayed trees Arboricultural Journal Volume 26 Number 1 April 2002.

BRITISH STANDARD

BS 5837:2012

Allowance needs to be made for the swaying of stem and branches during storm conditions. Branches which are liable to strike the structure need to be removed or pruned back to a suitable branching point as appropriate (see BS 3998:2010).

Table A.1 Minimum distance between young trees or new planting and structure to avoid direct damage to a structure from future tree growth

Type of structure	Minimum distance between young trees or new planting and structure, in metres (m)		
	Stem dia. <300 mm ^{A)}	Stem dia. 300 mm to 600 mm ^{A)}	Stem dia. >600 mm ^{A)}
Buildings and heavily loaded structures	—	0.5	1.2
Lightly loaded structures such as garages, porches etc.	—	0.7	1.5
Services			
<1 m deep	0.5	1.5	3.0
>1 m deep	—	1.0	2.0
Masonry boundary walls	—	1.0	2.0
In-situ concrete paths and drives	0.5	1.0	2.5
Paths and drives with flexible surfaces or paving slabs	0.7	1.5	3.0

^{A)} Diameter of stem at 1.5 m above ground level at maturity

A.1.3 Allowance for future growth

Where the installation of paths or light structures such as walls is unavoidable near to trees, the design and construction specification needs to take account of future growth.

If it is necessary to build a wall or similar structure over a root greater than 50 mm diameter, provision for future diameter growth needs to be made by surrounding the root with uncompacted sharp sand, void-formers, or other flexible fill materials, and by laying an adequately reinforced lintel or raft over the surface.

THE EFFECTS THAT DEVELOPMENT PROPOSALS MAY HAVE ON THE AMENITY VALUE OF THE TREES

Relates to both trees on and near the site.

The loss of trees on the site has been considered earlier in the Report and a significant proportion of tree cover remains especially to the periphery of the site giving it a mature landscaped setting. This is further enhanced by the proposed planting under the landscaping scheme.

Trees often come under pressure when placed directly against housing or gardens and can come under pressure for pruning and /or tipping of garden waste and household rubbish, however space and buffers are often in place.

The location of trees to the south of house Plots 15-20, 81, 155, 112 & Felthorpe Lodge may come under the greatest pressure for pruning or removal via the Tree Preservation Order process, which most of the trees are protected under. However, there will be level changes with houses being in a slightly elevated position that will somewhat ease this pressure. Potential house buyers will be advised of the protection afforded to the trees under the Tree Preservation Order, during land searches. Also, these trees are in maturity and an obvious feature when viewing such houses.

THE END USE OF THE SPACE

The site is already extensively developed with buildings and car parks, and the proposed development mimics this developed footprint. The historic buildings are often associated with the trees of greatest amenity value and with both being retained, their status quo is maintained.

The investment in mitigation planting often of large planting stocks will enhance the groups of the greatest amenity value (G23, G6, G7 and the open spaces to the south-west), with an opportunity to introduce and replace unusual species and large species trees at maturity. These will grow in plentiful space, allowing them to reach maturity as an open grown specimen.

GENERAL COMMENTS AND OBSERVATIONS

Any construction work can have a negative effect on tree health and stability if their underground parts, which are frequently ignored, are damaged or severed. Above ground parts may become injured or broken through impact/collusion damage. Retained trees will require physical protection from such injury during the development phase from the onset. Barrier fencing must be installed to create an exclusion zone around the trees and enclose the necessary Root Protection Area. Its location and design must follow an approved¹¹ Tree Protection Plan. The type of barrier fencing recommended for this proposal is produced below in Figure 2 below and is taken from the British Standard. The positioning and suitability of the protective fencing must be assessed and signed off by the Project Arborist prior to all works commencing (enabling tree works may be excluded).

Providing the needs of the trees are catered for and that care is taken during construction to protect their roots and stems, it is reasonable to predict that no long-lasting disruption to the retained trees physiology is perceived.

The Arboricultural Method Statement (AMS) element of this report along with Tree Protection Plan (TPP) **must** be followed rigorously during construction. It is strongly recommended that a 'Project Arborist' is engaged for the duration of the demolition and construction period, to oversee tree protection matters and be on hand to provide any arboricultural advice and maintain a level of communications between the client and Local Planning Authority's Tree Officer through submission of monthly progress reports. As discussed, consultation at the detailed design stage will be required with the Project Arborist throughout the project.

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. The National Joint Utilities Guidance 4 (NJUG), which is a guide for utility companies when installing services, is not relevant under Planning Conditions and the more stringent protection measures under Section 7.7. of BS5837 Trees in relation to design, demolition and construction – Recommendations (2012), apply. Utility companies must be instructed accordingly and follow the British Standard.
- 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.

¹¹ Approved by the Local Planning Authority

- 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, below).

NOTES

- In all instances, local planning authority consent for all tree work will be required.
- All tree work should be in accordance with BS3998 Tree Works – Recommendations (2010).

**AUDITABLE SYSTEM OF ARBORICULTURAL SITE MONITORING, INCLUDING A SCHEDULE OF SPECIFIC SITE EVENTS
REQUIRING INPUT OR SUPERVISION.**

Successfully retaining trees on any development site 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, which is fundamental in maintaining a level of arboricultural 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 the Project Arboriculturalist, 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 within planning conditions or altered by the LPA at any time during the permitted development.

Schedule of Watching Brief Visits

- The Project Arborist should attend site on a weekly basis given the statutory protection afforded to many trees on site, their quality and quantity.
- Watching Brief Reports must be submitted to the LPA and the developer at the end of each month.
- The Report will include details of the visit, list any concerns, recommend remedial actions to protect trees where necessary and will include photographs.
- Where applicable arboricultural works over and above those listed in the AIA/AMS and requiring the written permission of the Local Planning Authority may be sought via the Arboricultural Watching Brief report.
- The suitability of the root protection fencing will be assessed to ensure it remains fit for purpose.
- The Project Arborist must supervise all approved works that occur within any Root Protection Areas.
- The Project Arborist must be consulted and /or supervise all those items listed as 'Site Specific, Arboricultural Events' , below.

Communications List (all to be confirmed)

Mr. Vaughan Lewis (Principal Project Arborist)

Steve Ambler & Sons Tree Specialists Ltd

Email – vaughan@steveamblerltrees.com

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Scott Ambler (Project Arborist)

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Mrs. Shona Carle (Woodlands Officer)

Newport City Council

Environment & Economy Department

Civic Centre

Newport

NP20 4UR

Email - shona.carle@newport.gov.uk

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Matthew Coyle (Site Manager)

Redrow Homes

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Mob: 07776964821

RECOMMENDATIONS

1. Appoint a Project Arborist for the duration of the development to monitor and advise on tree protection and liaise with the Local Planning Authority where required.
2. Follow the method statement for trenchless technology to install services within the RPA of Tree 10 (T10).
3. Follow the method statement for trenchless technology to install services within the RPA of Group 3 (G3).
4. Should any services apparatus need to be removed within the Root Protection Area or crown spread of retained trees then a method must be agreed in consultation with the Project Arborist and under their supervision.
5. Fully implement the Recommendations within the Findings Table (Table 2). All works to be supervised by the Project Arborist and undertaken by a suitably qualified and competent tree surgery operative.
6. Early consultation required with the Project Arborist to take on-site measurements where the swales and /or fencing may be close to the Root Protection Area of trees. If conflicts occur, then swales and fencing will be set back from Root Protection Areas. Project Arborist to undertake site supervision in certain locations if pinch points occur.

SITE SPECIFIC ARBORICULTURAL EVENTS

- Marking out the RPAs of retained trees
- Installation of Tree Protection Fencing.
- Signing off the tree protective fencing as 'fit for purpose'
- Demolition works near trees (also covered in part within a previous Report¹²)
- Installation of the SWALES in close proximity to the trees RPAs
- Installation of drainage within the RPA of tree T10 and Group 3
- Landscaping activities within the Root Protection Areas.
- Consultation required with Project Arborist should the route of service runs change, and they occur near or within the Root Protection Area of trees.
- Any works that occur within the RPA or very close to it.

¹² Caerleon University Campus AMS_TPP Phase 1 demolition July 2020

Arboricultural Implications Assessment & Arboricultural Method Statement at Caerleon Former University Campus. Dated January 2025. (Revision 4)

REPORT LIMITATIONS

It must be stressed that this arboricultural impact assessment is not a risk assessment or a detailed report on the health and condition of the trees. It has been produced as a desktop review.

Every attempt has been made to provide a realistic and accurate assessment of the impact of the development on the trees. . no liability can be accepted for any tree related issue or tree and building interactions in the absence of information or where information is unclear or misleading.

This report is based on the tree circumstances and condition at the time of the original tree survey. It must be recognised that the circumstances may be altered radically over the course of time and any development process and that such changes cannot be accurately predicted. The report does not provide any specific long-term tree management recommendations.

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.

This report 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.

LEGAL CONSTRAINTS

The legal constraints of any site should be considered in early planning and well before any work commences on site. Such legal constraints should be fully considered from the outset to avoid time delays. The legal constraints referred to here are general constraints relating to arboriculture only and not any other legal matter that may arise.

Tree Preservation Orders and Conservation Area Status

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.

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. The **Arboricultural Association** at Ampfield House, Ampfield, near Romsey, Hampshire. Telephone 01794 368717 are able to provide advice on suitably qualified persons or indeed suitable qualifications a person should hold to undertake qualified inspections.

GLOSSARY OF TERMS

Adventitious; Latent or dormant bud on stem or root often invisible until stimulated into growth which occurs from an unusual place i.e. not a twig, leaf or bud.

Arboriculture: the culture and management of trees as groups and individuals, primarily for amenity and other non-forestry purposes.

Arboriculturalist; person who has, through relevant education, training and experience, gained recognised qualifications and expertise in the field of trees 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 arboriculturalist, 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

Buttress zone: the region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper sides of the junctions

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

Construction Exclusion Zone; this is an area established where construction is not permitted and usually correlates to the Root Protection Area.

Crown: in arboriculture the main foliage-bearing portion of a tree

Defect: in relation to tree hazards, any feature of a tree that detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment.

Diameter (DBH) The diameter for each tree is in millimetres based on the diameter or circumference of the trunk measured at a height of approximately 1.5 metres above ground level, unless otherwise stated. All measurements are approximate

Dysfunction: in woody tissues, the loss of physiological function, especially water conduction.

Energy: the capacity to do work (THROUGH PHOTOSYNTHESIS, GREEN PLANTS ABSORB ENERGY FROM SUNLIGHT AND STORE IT IN THE FORM OF CHEMICAL COMPOUNDS WHICH ARE USED IN ENERGY-DEPENDANT PROCESSES SUCH AS GROWTH)

Failure: in connection with tree hazards, a partial or total fracture within woody tissues or loss of cohesion between roots and soil. (IN TOTAL FAILURE THE AFFECTED PART SNAPS OR TEARS AWAY COMPLETELY. IN PARTIAL FAILURE, THERE IS A CRACK OR DEFORMATION WHICH RESULTS IN AN ALTERED DISTRIBUTION OF MECHANICAL STRESS)

Group; the term 'group' is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues or screens) or culturally including for biodiversity (e.g. parkland or wood pasture).

Arboricultural Implications Assessment & Arboricultural Method Statement at Caerleon Former University Campus. Dated January 2025. (Revision 4)

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.

Leader: in a tree, a topmost shoot that has apical dominance.

Preventive action: in a tree hazard management, action that helps to prevent injury to persons or damage to property.

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; this is a protection area established around the base of each tree to prevent physical, chemical or compaction damage occurring. Protection to the RPA is achieved through the erection of fencing or another suitable barrier.

Soil heave: see heave

Special Precaution Area; this is an area, usually within the root protection area, where construction or other activity may be permitted but only under the direction of a 'Arboricultural Method Statement' and the supervision of an Arborist.

Species The species is the given name of the tree which is usually provided in both the common and scientific names.

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.

Targets: in a tree hazard assessment (and with somewhat incorrect terminology), persons or property or other things of value, which might be harmed by mechanical failure of the tree or by objects falling from it.

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 Arboriculturalist 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 arboriculturalist 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.

Vigour: in tree assessment, an overall measure of the rate of shoot production, shoot extension or diameter growth (cf. vitality)

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.

Wind exposure: the degree to which a tree or other object is exposed to wind, with regard both to duration and velocity.

Wind pressure: the force exerted by wind on a tree or other object.

Wind snap: the breaking of a tree stem by wind.

Windthrow: the blowing over of a tree at its roots.

REFERENCES

1. BS 5837: 2012 Trees in Relation to Design, Demolition and Construction - Recommendations
2. S. Ambler - Tree Survey, Tree Categorisation, and Tree Constraints Plan at Former Caerleon Campus. Feb-April 2019.
3. BS3998 Tree Works – Recommendations (2010).

APPENDICES

FLOW DIAGRAM – PLANNING FOR TREES IN DEVELOPMENT.

GROUP 23. NORTH – EAST SECTION – DETAILED TREE CONSTRAINTS PLAN

TREE PROTECTION PLAN WITH TREE RETENTION / REMOVAL

FLOW DIAGRAM – PLANNING FOR TREES IN DEVELOPMENT.

BS 5837:2012

BRITISH STANDARD

**Annex B
(informative)**

Trees and the planning system

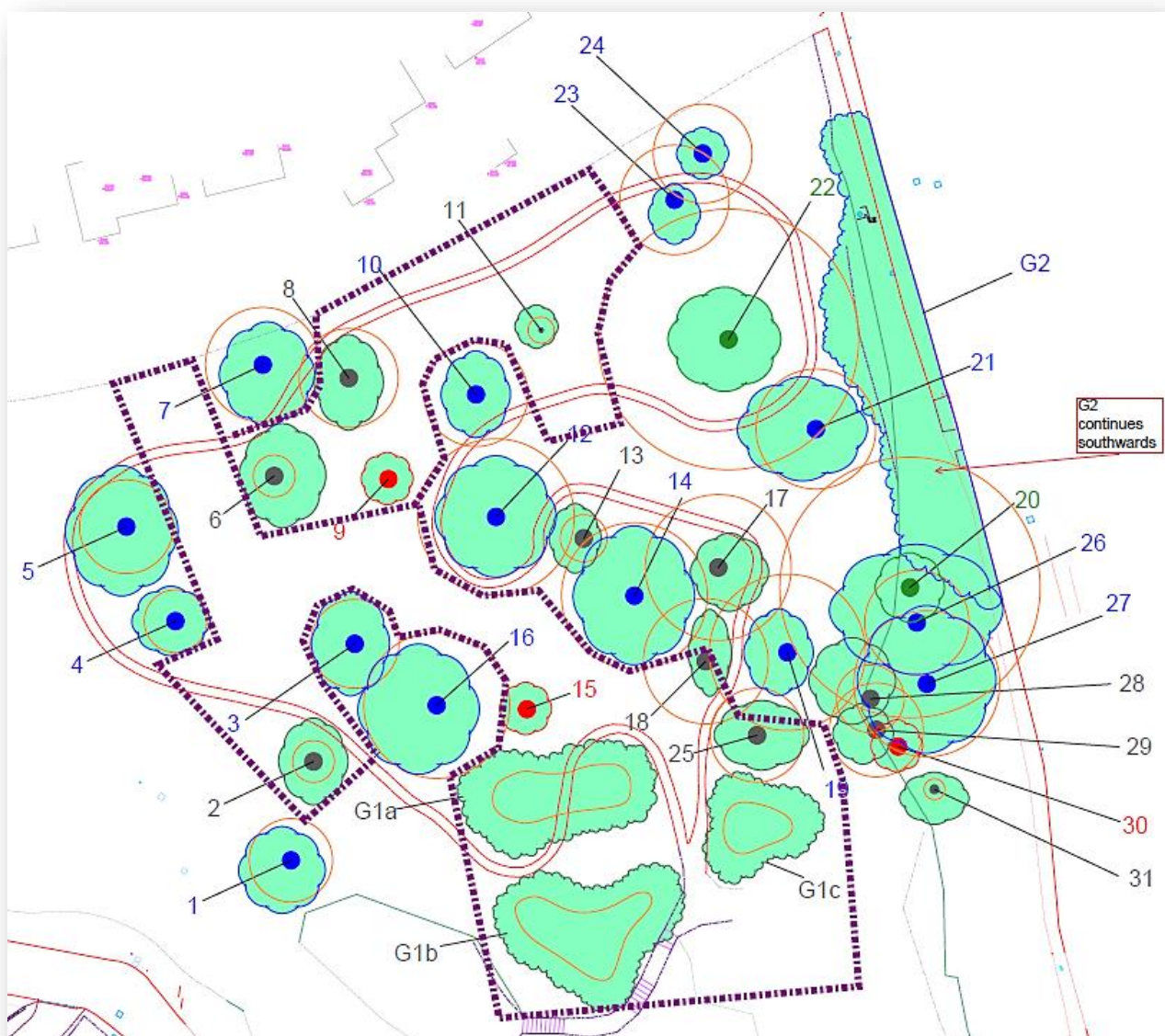
Under the UK planning system, local authorities have a statutory duty to consider the protection and planting of trees when granting planning permission for proposed development. The potential effect of development on trees, whether statutorily protected (e.g. by a tree preservation order or by their inclusion within a conservation area) or not, is a material consideration that is taken into account in dealing with planning applications. Where trees are statutorily protected, it is important to contact the local planning authority and follow the appropriate procedures before undertaking any works that might affect the protected trees.

The nature and level of detail of information required to enable a local planning authority to properly consider the implications and effects of development proposals varies between stages and in relation to what is proposed. Table B.1 provides advice to both developers and local authorities on an appropriate amount of information. The term "minimum detail" is intended to reflect information that local authorities are expected to seek, whilst the term "additional information" identifies further details that might reasonably be sought, especially where any construction is proposed within the RPA.

Table B.1 Delivery of tree-related information into the planning system

Stage of process	Minimum detail	Additional information
Pre-application	Tree survey	Tree retention/removal plan (draft)
Planning application	Tree survey (in the absence of pre-application discussions) Tree retention/removal plan (finalized) Retained trees and RPAs shown on proposed layout Strategic hard and soft landscape design, including species and location of new tree planting Arboricultural impact assessment	Existing and proposed finished levels Tree protection plan Arboricultural method statement – heads of terms Details for all special engineering within the RPA and other relevant construction details
Reserved matters/ planning conditions	Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method Dimensioned tree protection plan Arboricultural method statement – detailed Schedule of works to retained trees, e.g. access facilitation pruning Detailed hard and soft landscape design	Arboricultural site monitoring schedule Tree and landscape management plan Post-construction remedial works Landscape maintenance schedule

GROUP 23. NORTH – EAST SECTION – DETAILED TREE CONSTRAINTS PLAN



TREE PROTECTION PLAN WITH TREE RETENTION / REMOVAL

Issued separately as a pdf and dwg due to large size - Drawing Number SAAC.19.012d - Tree Protection Plan with Tree Retention / Removal for AIA & AMS Former University Campus, Caerleon.