USW Caerleon

Landscape and Ecology Management Plan

Prepared by:
The Environmental Dimension Partnership Ltd

On behalf of:
Redrow Homes (South Wales) Ltd

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Section 1
Introduction

1.1 This Landscape Management Plan (LEMP) has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of Redrow Homes (South Wales) Ltd (hereafter referred to as 'the Developer') in relation to USW Caerleon (hereafter referred to as 'the Development Site').

1.2 A hybrid planning application for residential development (reference 17/0781) was previously submitted to Newport City Council (NCC) in August 2017, with full permission sought for the partial demolition, refurbishment and conversion of the main building to 42 flats, conversion of the TJ Welby building and Felthorpe House to dwellings, and expanded use of the Kegie building to include office space. In addition, outline consent was also sought for the demolition of all other existing buildings alongside the construction of up to 263 dwellings, 2,400 sqm of flexible non-residential floorspace, a changing room facility, alterations of accesses off Lodge Road and College Crescent, retention of existing rugby pitch and College Road gate piers, alongside proposed open space, landscaping, engineering and infrastructure works, with access to be considered and all other matters reserved.

1.3 In light of significant adverse effects upon highway safety, traffic, residential amenity and air quality however, planning permission was refused in October 2018. As such, a new detailed planning application submission was submitted to NCC in December 2019 (planning reference: 19/1212), to comprise:

- The construction of circa 160 dwellings, including new build and the creation of apartments within the listed buildings that are to be converted/retained within the Development Site;
- Landscaping (including re-grading) and sustainable drainage works;
- Access/Infrastructure works; and
- Removal and translocation of specified trees currently subject to a Tree Preservation Order (TPO) (the remainder of the tree stock subject to a TPO will be retained).

1.4 To inform the new planning application submission, the Development Site was subject to a detailed ecological assessment completed by EDP during 2019, to determine any material changes occurring over the interim period to those habitats and protected/notable species supported/potentially supported by the Development Site, as previously assessed by Tyler Grange in 2015 and Ecosulis during 2015 and 2016 to inform the initial planning application submission.

1.5 The development proposals are illustrated within the Proposed Site Plan provided at **Appendix EDP 1**.

Section 2
Scope, Aims and Responsibilities

Scope

2.1 This LEMP will extend over the lifetime of the development, requiring subsequent monitoring and review of all operations set out within this document at five-year intervals post-development, so as to take account of any changes to the Development Site or other influencing factors which may become evident as ecological features become established and approach maturity. It will also further the design principles established at the time of the outline application for this development.

2.2 The LEMP addresses all habitats and features of ecological value to be affected by the enabling/pre-construction and construction phases of the development works and sets out the management tasks to be undertaken prior to and during the construction phase and post-construction phase of the development. In particular, it details those management recommendations for all features of ecological interest located within the development footprint including areas of green open space, and boundary features to be retained, enhanced and created.

2.3 The management scheme defined within this LEMP is structured to take into account the following phases of the development works:

- Enabling and Pre-Construction Phases;
- Construction Phase; and
- Long-term management and maintenance.

Aims

2.4 The rationale for this LEMP is to facilitate the establishment and management of those ecological components specific to the consented development. Specifically, this LEMP aims to:

- Set out measures for the appropriate and effective protection of retained features of landscape and ecological value during the pre-construction and construction phases;
- Ensure the appropriate management of any tree/vegetation works including clearance, planting and establishment during each phase of development; and
- Set out measures for the long-term management and maintenance of all areas of soft landscaping associated with the development to ensure that such features are

Section 3
Biodiversity Interest

3.1 This LEMP incorporates pertinent baseline information and recommendations documented within the Ecology Baseline Report (report reference edp5601_r001f), Ecology Chapter of the Environmental Statement prepared by EDP in November 2019 and Supplementary Environmental Statement prepared during October 2020 to inform the planning application submission.

Ecology Baseline

3.2 A desk study exercise and Extended Phase 1 Habitat survey was initially undertaken by Tyler Grange in 2015 and subsequently reported by Ecosulis in 2015/2016. To update the ecological baseline and verify the results of previous survey effort, an update Extended Phase 1 habitat survey was undertaken by EDP on 09 May 2019 to inform the development proposals.

3.3 The Development Site is dominated by hardstanding and buildings which are predominantly vacant, in addition to areas of amenity grassland and ornamental shrub planting. The north-eastern corner and eastern boundary of the Development Site is characterised by an unmanaged, tussocky grassland sward with scattered non-native and native trees. Such habitats are considered to be of limited/negligible ecological importance although adjacent semi-natural broadleaved woodland and trees with TPOs scattered across the Development Site are considered to be of local importance. Habitats within and adjacent to the Development Site provide opportunities for bats, breeding birds, badger (*Meles meles*), common reptiles, amphibians and notable mammal species including European hedgehog (*Erinaceus europaeus*). As such, further detailed surveys with respect to roosting and commuting/foraging bats, badger, common reptiles and great crested newt (*Triturus cristatus*) were undertaken by EDP throughout 2019 the results of which are documented with an Ecology Baseline Report (report reference edp5601_r001f) submitted to NCC with the ES.

3.4 The following valued ecological resources considered of local importance or above were identified for the Development Site during baseline ecological investigations previously undertaken during 2015-2017 and further updated in 2019:

- Statutory designations within the potential zone of influence of the Development Site of International/National level importance, including: the Severn Estuary Special Area of Conservation (SAC)/Special Protection Area (SPA)/Ramsar situated circa 7.3km from the Development Site; and the River Usk SAC/Site of Special Scientific Interest (SSSI), located circa 0.7km from the Development Site;

Ecological Features to be Retained and Enhanced

3.9 In line with those baseline conditions and recommendations detailed within the Ecology Baseline report (report reference edp5601_r001f) and Ecology Chapter of the Environmental Statement, the development has been designed to retain, protect and further enhance those valued ecological features detailed above within the scheme as far as possible.

3.10 This has/will be achieved through the following design principles:

- Minimising pre-construction and construction impacts upon habitats and species through the implementation of sensitive working methods throughout the construction period;
- Demolition of buildings with confirmed bat roosts in accordance with a European Protected Species (EPS) License from Natural Resources Wales (NRW);
- Retention of mature trees and broadleaved woodland across the Development Site as far as possible, whilst ensuring their future protection, enhancement and maintenance over the long-term;
- The long-term retention, enhancement and management of poor semi-improved grassland habitat located within the north-east corner of the Development Site. This is in addition to the retention and enhancement of grassland along the southern boundary of the Development Site and within the west;
- The creation and long-term management of formal and informal areas of green space, to include tree and grassland planting for the benefit of both public amenity and wildlife whilst further protecting and enhancing ecological connectivity across the Development Site to the wider landscape;
- The creation of sustainable drainage features (swales) which will be subject to new planting with an appropriate wetland flora, so as to diversify habitats suitable for protected species;
- The inclusion of formal tree, hedgerow and shrub planting along the frontages of residential housing and roadways; and
- The inclusion of habitat features to enhance the Development Site for nesting birds and roosting bats.

3.11 Subject to implementation of the above, it is considered that the landscape strategy proposed for the Development Site, upon which this LEMP is based, is consistent with those biodiversity objectives previously established.

Section 4
Ecological Method Statement

4.1 This section sets out the appropriate working practices and safeguards to be deployed throughout the pre-construction phase of the development, including all associated enabling works, to protect the ecological and landscape interests of the Development Site as discussed in **Section 3**. Measures relating to ecological supervision, the protection of retained habitats, vegetation clearance and pollution prevention/control, along with specific measures relating to wildlife, are discussed to ensure the appropriate protection, maintenance and management of all valued features prior to and during construction.

Pre-Construction and Enabling Works

4.2 To facilitate commencement of construction, it is anticipated that site clearance and associated pre-construction/enabling works will commence from autumn/winter 2020, subject to receipt of planning approval and discharge or relevant planning conditions, alongside approval of a Development Licence from NRW, where necessary in respect of bats.

Pre-commencement Site Check

4.3 Prior to commencement of all pre-construction and construction works the development footprint shall be checked by a suitably qualified ecologist to ensure there has been no significant material changes to the existing ecological interest of the Development Site and that no protected or notable species, which could be harmed by the development, have moved onsite since the previous surveys were carried out. Should any protected species be found during this check, full details of mitigation measures to prevent their harm shall be submitted to and approved in writing by the Local Planning Authority. Where additional mitigation and/or precautionary working methods are required, this document will be updated accordingly.

Site Briefings and Ecological Clerk of Works

4.4 The appointed Ecological Clerk of Works (ECoW) will be responsible for the provision of site briefings and information to the Principle Contractor and all relevant sub-contractors and site personnel, on all potential ecological receptors and constraints associated with the land area comprising the development footprint, including all species-specific control measures to be adhered to during the construction phase.

4.5 Specifically, and prior to the commencement of pre-construction and construction phases, 'tool box talks' will be provided by the ECoW to the Principal Contractor appointed by the Developer, and all relevant sub-contractors and site personnel, to ensure that the identification and protection of protected species and their habitats is fully understood and appropriate, and that agreed mitigation is implemented.

Control of Weeds and Invasive Species

4.13 Ecological surveys undertaken by EDP did not identify any invasive plant species[2] within the Development Site. Nevertheless, given their likely presence within the locality and vigorous nature of their spread, a prior inspection of the construction footprint for the presence of invasive species is advised before the commencement of any vegetation clearance onsite. Where identified, such areas will be marked out and subject to prior treatment and control in accordance with those methodologies prescribed by a specialist contractor, so as to avoid accidental disturbance and spread.

Sensitive Vegetation Clearance

4.14 Construction of the development footprint will result in the clearance of amenity grassland and selective clearance of tree, shrub and scrub habitat. This is in addition to selective, temporary clearance of poor semi-improved grassland habitat within the north-east corner of the Development Site, necessary to create a new footpath connection. Such habitats have the potential to support protected and notable species, including bats, nesting birds, badger, common reptiles and other notable mammal species including European hedgehog (*Erinaceus europaeus*). As such, precautionary measures will be adopted during clearance to ensure the avoidance of harm/injury and disturbance to such species and are detailed below. Specific measures in respect of badger are also provided.

Grassland Habitat

4.15 Clearance of grassland habitat required to accommodate the development footprint, and will be undertaken as follows:

- The clearance of grassland habitat located across the demolition footprint, will be undertaken between April and October (when temperatures are above 9ºC) so as to avoid the main hibernation period of common reptiles and mammals. As such works will coincide with the bird breeding season (typically March to August inclusive), a pre-commencement check for active bird nests, particularly with respect to ground nesting birds, will be undertaken by a suitably qualified ecologist/ECoW immediately prior to the commencement of works. Where an active bird nest is identified, a 5-10m buffer (dependent on individual species requirements, and potentially greater, as specified by the ecologist at the time) will be established around the active nest, with no clearance works permitted within this buffer until all young have fledged and the nest confirmed inactive by the ECoW;

- Should the above seasonal constraint be considered impracticable, then clearance works between November and early March inclusive may require pre-commencement checks and/or supervision by the ECoW to ensure no disruption

[2] Invasive species comprise those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), for which it is an offence to plant or otherwise cause these species to grow in the wild. Such species are also classed as 'controlled waste' under the Environmental Protection Act 1990, requiring for their safe disposal at a licensed landfill site if taken offsite.

requirements, and potentially greater, as specified by the ecologist at the time) will be established around the active nest, with no clearance works permitted within this buffer until all young have fledged and the nest confirmed inactive by the ECoW;

4.17 Prior to clearance, trees and shrubs considered suitable for future translocation will be identified and marked up prior to commencement. Details pertaining to the locations of trees proposed for translocation are provided within the Arboricultural Method Statement provided at **Appendix EDP 5**.

4.18 With respect to the translocation of suitable specimens identified, such material will be excavated to a depth appropriate to root depth during the below-ground clearance works. Identified specimens will be gently lifted to ensure the root ball is fully intact and transferred to the receptor trench for replanting at similar heights as previous. Specimens will be backfilled with topsoil ensuring no roots are left exposed, with area firmed and sufficiently watered in.

4.19 Prior to clearance, all mature trees to be felled will also be subject to an update ground-level inspection by a suitably qualified ecologist to determine their current potential to support roosting bats. Where trees are identified as having moderate or greater potential, then such trees will be subject to a further detailed aerial inspection whereby all suitable roosting features will be checked at height for the presence of bats. Aerial surveys will be undertaken by a suitably qualified and NRW bat licensed ecologist, arboricultural contractor with a NRW bat survey licence, or with experience of working with bats and under the supervision of a NRW bat survey license holder.

4.20 If any bats are discovered during the aerial inspection, owing to the strict legal protection afforded to bats and their roosts, works are likely to require a Development Licence from NRW before works can continue.

4.21 If no evidence of roosting bats is uncovered during the aerial inspection, works may proceed without a Development Licence from NRW. However, regarding those trees identified as having potential to support roosting bats, a ‘soft felling’ technique’ involving the sectional dismantling of the tree will be adopted, involving the following:

- Tree felling will avoid cutting through any cracks, cavities, limb/knot holes or any other potential roosting features – i.e. by cutting above and below the feature when removing sections with suitable features;

- Any sections to be cut supporting suitable roosting features are to be suitably harnessed and supported before cutting using industry-standard rigging equipment, and gently lowered to the ground once cut, to avoid violent shaking of potential roosting features; and

be subject to all prescriptive methodologies detailed within a Development Licence approved by NRW. A Development Licence for buildings **B1**/**B2** and **B3**/**B4** specifically has previously been submitted and approved by NRW on 1 September 2021 whilst a modification to the licence following identification of a new common pipistrelle bat roost within building **B12**/**B13** was approved on 5 November 2021. In brief, a mitigation strategy is based on the following principles:

- Installation of 17 bat boxes (6 Schwegler 2F bat boxes, 6 Schwegler 2FN bat boxes and 5 Schwegler 1FF bat boxes or similar) on suitable retained trees within the Development Site prior to commencement of demolition;

- Pre-demolition inspection of each building for any additional signs of bats with delivery of a toolbox talk to the demolition contractors;

- Soft-stripping of potential roosting features associated with Buildings **B1**/**B2**, **B3**/**B4**, **B12**/**B13** and **B16** under supervision of the named ecologist or accredited agent; and

- Installation of permanent, compensatory roosting features with newly constructed residential houses comprising 12 Schwegler 1FR bat tubes (or similar) in addition to construction of a purpose-built bat loft void provided within a proposed new garage attached to Felthorpe House (**B16**).

4.29 With respect to remaining onsite buildings including buildings **B5** - **15** with potential to support roosting bats an update assessment by an NRW bat licenced ecologist be undertaken prior to demolition, particularly should no works be undertaken within 12 months of the previous assessment. Such pre-commencment surveys will include an update external and internal visual inspection of each building for current potential to support roosting bats and/or evidence of roosting bats. In respect of those buildings assessed as having low to high potential to support roosting bats, further dusk emergence and/or dawn re-entry surveys will be undertaken during the main bat activity season (May-September) as necessary in accordance with best practise bat survey guidelines[3], to confirm presence/infer absence of a bat roost.

4.30 If roosting bats are discovered during the inspection, owing to the strict legal protection afforded to bats and their roosts it will then be necessary to obtain a Derogation Licence from NRW prior to works commencing, with sufficient replacement roosting habitat provided. If no evidence of roosting bats is uncovered during the update inspection, works may proceed without an NRW Development Licence.

4.31 Site contactors will be subject to a 'tool-box talk' by an NRW licenced bat ecologist prior to commencement of any demolition works. The briefing will outline the protected status of bats and breeding birds, alongside relevant legislation, and detail all methods and sensitive working practices to be employed throughout the demolition phase, given the

[3] Collins, J. (ed.) (2016). *Bat Surveys: for Professional Ecologists: Good Practice Guidelines* (3rd edition). The Bat Conservation Trust, London

- Working at night will be avoided as far as possible;

- All trenches/excavations will be covered up overnight and/or a means of escape provided (such a s mammal ramps) to avoid wildlife becoming trapped; and

- Any open pipework with an outside diameter of greater 120mm must be covered at the end of each working day to prevent animals entering/becoming trapped.

Maintenance of Areas Cleared of Vegetation

4.37 Should there be a delay between the end of the pre-construction phases and the beginning of the construction works phase such that vegetation begins to re-colonise the construction footprint, then such vegetation will be subject to regular cutting to ensure heights are maintained at circa 20mm or less, or else maintained as bare ground to deter the return of wildlife to the construction area.

4.38 Any remedial or formative pruning required of trees will be undertaken between October and February inclusive in accordance with good horticultural and arboricultural practice with thinning, trimming and shaping of specimens undertaken as appropriate to species, location, season, and stage of growth. Where such works are required to trees with TPO'S, the LPA will be consulted and any additional permits for such activities sought. All arisings from any vegetation clearance will be taken away from the vicinity of the development footprint no later than the day after vegetation clearance.

4.39 Demolition/damage to retained boundary vegetation will be avoided, with exception to small sections where repairs, new planting, or site access is required.

4.40 Any spoil, rubble, brash and/or debris collected as a result of the construction works will be removed from site or stockpiled within the centre of the site and away from the vegetated boundaries.

Topsoil and Mulch

4.41 To ensure that all available topsoil from the Development Site is protected and retained for future re-use onsite, or for use in a sustainable manner, all temporary topsoil storage will be in accordance with BS3882:2007 *Specification for topsoil and requirements for use*.

4.42 Following vegetation clearance im accordance with those measures above, topsoil removal should ideally avoid periods of heavy rain and stripped to a depth of 200mm. Machinery used for earthworks will be selected to minimise disturbance and compaction. Topsoil will not be mixed with subsoil, stone, hardcore or rubbish.

4.43 Handling of topsoil with be kept to a minimum and either re-used or stockpiled immediately after stripping. Where stored, loose bunds will be created no more than 2m wide and 1m high. No machine will be permitted to run across the bund at any one time and the bund should be shaped from the side only. Thereafter no other material will be

Section 5
Habitat Creation and Landscape Planting (Construction Phase)

5.1 This section sets out the proposed habitat creation and landscape planting works to be completed across the development footprint, with further details and specifications included at **Appendix EDP 2** and **3**, to ensure that appropriate measures to provide biodiversity enhancement and visual amenity are implemented from the early stages of the scheme. Such measures have been designed with reference to those mitigation principles previously set out within the Ecology Chapter H of the ES and SES.

Construction Phase

5.2 The construction start date is anticipated to commence from autumn 2020, subject to approval of the planning application and/or demolition consent and discharge of planning conditions, alongside the approval of a Development Licence from NRW where applicable.

5.3 Ecological management, habitat creation and planting works to be undertaken during the construction works phase are described further below. Where repeat actions are necessary, the frequency and timings of tasks are specified accordingly.

Habitat Creation and New Planting Areas

5.4 A range of new habitats and landscape features will be established during the construction phase of the development or in the first planting season. Public open space area will also be created in the central location of the Development Site. The exact locations, planting densities and species incorporated into the new planting areas are illustrated within the Detailed Soft Landscape Plan and Detailed Soft Landscape Design with Plot Planting at **Appendix EDP 2** and **3** respectively.

5.5 Given the potential of the Development Site to support protected species including breeding birds, a bat assemblage, badger, common reptiles and European hedgehog the development has been designed to retain, protect and enhance key habitat for protected species.

5.6 Retained and enhanced habitats associated with the northern-eastern, eastern and southern boundaries of the Development Site (comprising poor semi-improved grassland, woodland and tree and shrub planting), in addition to new habitat features including swales, wildflower grassland, trees and shrubs will require ongoing sensitive and appropriate management over the lifetime of the development given the presence of protected and notable species onsite. Sensitive management will seek to enhance the value of foraging, dispersal, breeding and hibernation resources for protected and notable species whilst also providing areas of green open space for new residents.

- Plants will be vigorous, weed, pest and disease free, and not suffering from drought, waterlogging, windburn, damage or nutrient deficiency. Fresh grass seed and turf produced for the current growing season will be used. Any substitutes will otherwise be approved by the project landscape architect;

- Transport and handling of plants shall comply with 'Handling and Establishing Landscape Plants' (Horticultural Trades Association), including protection from desiccation or any other damage prior to planting out;

- Prior to undertaking planting or seeding, all rubbish, debris and surface stones exceeding 75mm in any direction are to be removed from site. Any substance or materials injurious to plant growth including any rubble, fuel or lubricants will be removed prior to commencement of planting;

- Watering will be undertaken as necessary by the Developer to ensure the establishment and thriving of all planted areas. Typically, watering will be undertaken every week from March to October for the first year, to ensure the establishment and thriving of all planted areas. Watering will be to the full depth of the topsoil. If supply is restricted by emergency legislation, watering will not be carried out unless instructed to do so. When watered, the soil of the base of the tree/shrub should be damped but not waterlogged. During years 2-3, watering should be undertaken as required and particularly during prolonged dry weather;

- All areas where newly planted or translocation trees have failed to thrive (through death, damage or disease), will be identified by the Developer and plants will be removed and replaced with equivalent species to match the size of adjacent nearby plants in the next appropriate planting season, as frequent as necessary. The advice of the project Landscape Architect will be sought wherever possible; and

- All plants will be pruned to promote healthy growth and natural shape, and any dead, dying or diseased wood and suckers will be removed. Overhanging branches will be pruned to ensure that growth is prevented from encroaching onto paths, signs, sightlines and road lighting. Pruning will be undertaken annually or as appropriate to each species between October and February inclusive, to avoid the main bird breeding season, and undertaken according to best practice. All arisings will be removed for composting.

Habitat Creation Areas

Grassland

5.9 Inherent within the development is the proposed retention and enhancement of poor semi-improved grassland located along the southern boundary of the Development Site. This is in addition to the retention of grassland habitat within the north-east corner of the Development Site, albeit for temporary loss/disturbance associated with re-engineering of levels in this area to accommodate a new footpath link. To maximise the botanical value and further enhance the carrying capacity of such habitats to be retained,

medium to long term species diversity. Prior to sowing, all large debris, litter, stones and earth clods will be removed.

5.13 Cultivation adjacent to established vegetation will take care to ensure no damage to existing root systems, with disturbance kept to the minimum necessary to expose fresh soil. Thereafter, grassland seed mix ill be sown in accordance with the supplier's specifications.

Sustainable Drainage Features (Swales and Attenuation Basins)

5.14 Sustainable drainage features (including swales) proposed onsite in association with the boundaries of the construction footprint and the site entrance will be planted with Emorsgate Meadow Grass Mixture for Wet Soils EG8 as described above, and where appropriate, will be further enhanced through plug planting of marginal/aquatic species to increase species diversity and improve water quality, including Fools water-cress (*Apium nodiflorum*), lesser pond sedge (*Carex acutiformis*), common spike rush (*Eleocharis palustris*), meadowsweet (*Filipendula ulmaria*), yellow flag iris (*Iris pseudacorus*), and water mint (*Mentha aquatica*).

Tree and Shrub Planting

5.15 New tree and shrub planting is proposed along the frontage of residential properties across the development footprint in addition to within and along the boundaries of open green space across the Development Site. This includes the transplanting of suitable specimens otherwise proposed for loss to suitable receptor sites across the Development Site where appropriate. In addition, new structural planting is proposed along the southern boundary of the Development Site.

5.16 The proposed planting schedule provided at **Appendix EDP 2** and **3** and includes a diverse mix of native species, and/or those of value as a foraging resource for wildlife.

5.17 The installation, maintenance and material standards for the landscape works will be undertaken in line with the following:

- Planting stock will be handled in accordance with the Horticulture Trade Association guidelines and will follow landscape specifications as provided by a Chartered Landscape Architect;

- Planting of landscaped areas with tree and shrub planting will be undertaken during the optimal window of between November and March or in accordance with the advice of the project landscape architect. Planting outside of this time will require the use of containerised stock and may involve additional irrigation arrangements;

- Any seeding will be carried out in mid to late spring or early autumn, depending on seasonal variations, in accordance with the advice of the project landscape architect;

annually or as appropriate to each species between October and February inclusive, to avoid the main bird breeding and dormouse active season and undertaken according to best practice. All arisings will be removed for composting;

- Spot weed control of all broad-leaved and injurious weed species listed in the Weeds Act 1959 will be undertaken using a suitable non-residual herbicide as and when required annually. The specification and use of herbicides or pesticides, including their use in proximity to water bodies, to comply with all contemporary Regulations, British Standards and Codes of Practice; and

- Soil debris and arisings will be swept from adjacent hard surfaces after each maintenance operation. All extraneous rubbish not arising from the contract works will be collected and recycled (where feasible) or else removed from site at each maintenance visit.

Hedgerows

5.18 Hedgrow planting is predominantly proposed along the frontages of residential housing and formal open space.

5.19 Planting instructions for new hedgerow trees will follow those provided above in relation to proposed tree and shrub planting, with new tree whips planted in double staggered rows at 300mm centres.

5.20 Ground preparation for hedgerow seeding will rid the soil of perennial weeds, through repeated cultivation or herbicide application, prior to sowing. Cultivation will only go to the minimum depth required to expose fresh soil into which new seeds are to be sown.

5.21 Once the ground has been suitably rid of perennial weeds and a fine tilth to sow into has been prepared, seeding will take place in the autumn or spring subject to sufficient soil warmth and moisture to aid germination. Seed will be surface sown by machine or broadcast by hand. Seeds will not be compressed into the soil but will be firmed in with a roller, or by treading. A slow release fertiliser will also be applied where appropriate. Topsoil trench shall be mulched with amenity bark mulch up to a depth of 75mm.

Woodland

5.22 In line with those recommendations detailed within the Ecology Chapter of the ES the development has been designed to retain and protect woodland habitat with selective loss of semi-mature/mature trees outwit but adjacent to the woodland boundary. Public access will, furthermore, be precluded given the location of woodland on steep bank sloping downwards to an adjacent road offsite. To maintain and enhance the condition of retained woodland habitat, the following management measures will be undertaken:

- Selective removal of encroaching scrub through cutting every 2-3 years on a rational basis between October and February to maintain a ground flora community undertaken. This may be combined with the removal of diseased and dying plants;

Bird Boxes

5.29 To further enhance bird nesting opportunities across the Development Site, nest boxes will be installed on retained mature trees and/or buildings as appropriate. A variety of new nest boxes are suggested to accommodate different bird species and include:

- Schwegler 1B nest boxes with 26mm holes for blue tit and coal tit;
- Schwegler 2M nest box with 32mm hole, used by great-, blue-, marsh-, coal- and crested tit, redstart, nuthatch, collared and pied flycatcher, wryneck, tree and house sparrows, and occasionally bats;
- Schwegler 3S nest boxes for starling;
- Swift bricks of swift boxes (e.g. Schwegler No 16. Swift Box);
- House sparrow nest box; and/or
- House martin nest box.

5.30 Bird boxes will be installed in accordance with manufacturer's specifications, on suitable aspects so as to be protected from strong wind, rain and sunlight, and at suitable heights of between 3m and 6m above ground level. Entrances will face away from prevailing winds and sources of light and within or immediately adjacent to good tree or hedge cover to increase the shelter and food source available.

5.31 The maintenance and repair of bird boxes installed upon across the Development Site during the pre-construction and construction phases will remain the responsibility of the Developer.

Hibernacula and Refugia

5.32 To enhance the Development Site for a common reptile population, hibernacula will be constructed within grassland habitat to be retained within the north-east corner of the Development Site. Hibernacula will be constructed in accordance with the following specifications:

- Finished size approximately 2m long, by 1m wide and 1m high, capped with topsoil and covered with turf;
- Hibernacula to be partially buried in a pit up to circa 0.5-1m deep and located within uncut areas of rough grassland vegetation;
- The body of each hibernaculum to contain a range of materials including cut timber, brash, inert hardcore, bricks, rocks, grubbed-up tree roots or building rubble;

Section 6
Establishment and Management Regime – Years 1-5 (Operation Phase)

6.1 This section details the management which will be undertaken for newly created ecological habitat features including areas of grassland, tree and shrub planting across the Development Site (**Appendix EDP 2** and **3**). The establishment and management regime for all created and enhanced habitats will require subsequent monitoring and review of all management and maintenance operations at five yearly intervals over the lifetime of the development.

General Measures – Establishment and Maintenance

6.2 Soil debris and arisings will be swept from adjacent hard surfaces after each maintenance operation. All extraneous rubbish not arising from the contract works will be collected and recycled (where feasible) or else removed from site at each maintenance visit.

6.3 Watering will be undertaken as necessary by the developer to ensure the establishment and continued thriving of all planted areas. Watering will be to the full depth of the topsoil. If supply is restricted by emergency legislation, watering will not be carried out unless instructed to do so.

6.4 Within the first 5 years following planting of each landscape area within each Phase of development all areas where newly planted/translocated plants or trees have failed to thrive (through death, damage or disease) will be identified and plants will be removed and replaced with equivalent species to match the size of adjacent nearby plants in the next appropriate planting season as frequently as necessary. The advice of the project landscape architect will be sought wherever possible. Any variation of this will only occur upon consent by NCC.

6.5 Spot weed control of all broad-leaved and injurious weed species listed in the Weeds Act 1959 will be undertaken using a suitable non-residual herbicide as and when required annually. The specification and use of herbicides or pesticides, including their use in proximity to water bodies, will comply with all contemporary Regulations, British Standards and Codes of Practice.

6.6 Bark mulch on all planted areas is to be topped-up to appropriate levels at least once in spring, with a second application in autumn as required.

invertebrates to drop out, but it may be necessary to use a mower or collector for practical reasons.

6.13 More generally, an assessment of all informal areas of grassland, meadow and bulb planting onsite will be undertaken at years 1, 3 and 5 from the first spring following planting by the Landscape Architect to ensure the adequate establishment of all plants, identify the presence of any undesirable species and disease and to determine whether remedial action is required, including replacement seeding/bulb planting for any lost/damaged specimens and additional management prescriptions necessary to ensure successful development. Additional monitoring will also be necessary during prolonged dry periods when new planting has a greater chance of failure. Thereafter, management measures will require subsequent assessment at five yearly intervals.

Amenity Grassland

6.14 Amenity grassland will be cut as and when necessary between March and the end of October to required heights of circa 30-50mm. Cutting will be suspended in periods of drought. All litter and debris to be removed before each cut.

6.15 At the time of each cut, all grass edges round the base of trees, manholes, etc. will be trimmed, taking precautions not to damage the tree trunks. All arisings will be removed, and all adjoining hard areas will be swept clear of cuttings and swept material removed.

6.16 The sward will be kept substantially free of broadleaved weeds where required, by applying a suitable approved selective herbicide. Fallen leaves will be removed in autumn.

6.17 Grassland will be watered as necessary to ensure a healthy sward until it has become established. Any areas of extreme wear, bare patches or wheel ruts will be reinstated by means of re-cultivation and re-seeding.

Sustainable Drainage Features (Swales and Attenuation Basins)

6.18 Management of newly created swales and attenuation basins throughout the establishment phase will involve annual inspections for the presence of invasive alien plant species, and aggressive native/naturalised plant species. The inspection will be undertaken by a suitably qualified specialist, with remedial works required to control the spread of these species, should they be present, implemented immediately. Control measures will involve cutting and removal, mechanical control through excavation if plants become well-established, hand removal for shallow-rooted plants, or treatment by herbicides suitable for use near water following guidance from the NRW.

6.19 The extent of colonisation of swales in particular will be reviewed every two years following creation by a Chartered Landscape Architect/Contractor. In the event that colonisation by target habitats of such features has been slow to the extent that margins remain as bare mud and/or devoid of desirable plants, then low-density plug planting of native flora will be undertaken where this will not interfere with drainage and attenuation.

6.28 Shelters and guards will be checked during each monthly maintenance visit. Plants are to be maintained upright and adjustments will be made following strong winds.

6.29 The condition of all stakes, ties and guards will be regularly checked by the Managing Agent or relevant appointed subcontractors, and all broken items will be replaced, and items regularly adjusted to accommodate tree /shrub growth and prevent rubbing. Any bark damage will be cut back neatly with a sharp knife. All plants will be straightened and the ground at the base to be firmed up.

6.30 An assessment of the condition of all retained and newly planted tree, hedge, shrub and scrub plants will be made by a qualified and experienced arboriculturist annually for a period of five years from the first spring following planting to ensure the adequate establishment of all plants, identify the presence of any undesirable species and disease and to determine whether remedial action is required, including replacement planting for any lost/damaged specimens and additional management prescriptions necessary to ensure its successful development. Additional monitoring will also be necessary during prolonged dry periods when new planting has a greater chance of failure. Thereafter, an assessment will be undertaken by a suitably qualified arboriculturist every two years.

6.31 Specific to those areas of woodland, trees and shrubs abutting construction areas or access routes, an annual inspection for damage will also be undertaken throughout the construction period. Where damage has occurred, appropriate and immediate action will be necessary, together with the revision and reinstatement of buffer zones and protective fencing, alongside the provision of toolbox talks to contractors.

6.32 All areas where newly planted/translocated plants have failed to thrive (through death, damage or disease) will be identified and plants will be removed and replaced with equivalent species to match the size of adjacent nearby plants in the next appropriate planting season, as frequent as necessary. The advice of a Chartered Landscape Architect or suitably qualified arboriculturalist will be sought wherever necessary.

6.33 All plants will be pruned to promote healthy growth and natural shape, and any dead, dying or diseased wood and suckers will be removed. Overhanging branches will be pruned to ensure that growth is prevented from encroaching onto paths, signs, sightlines and road lighting. All pruning will be undertaken in accordance with *BS 7370-4*.

6.34 The requirement for selective thinning of all newly planted trees/shrubs will be assessed and undertaken as necessary to ensure that overcrowding is reduced with increasing species maturity; that slower growing climax species are not outcompeted, and that diseased and dying plants are removed.

6.35 Where remedial work to mature trees is required, an update ground-level inspection by a suitably qualified ecologist will be undertaken to determine its current potential to support roosting bats. Where remedial works proposed are considered likely to impact upon potential bat roosting features, a detailed aerial inspection will be undertaken to further inspect suitable roosting features to be impacted for the presence of bats, prior to any commencement of tree works. Aerial inspections will be undertaken by a suitably

6.42 Prevent pollution by intercepting silt and cleaning run-off from hard surfaces before it enters the agreed discharge point (potentially existing water course).

6.43 Provide opportunities for habitat provision throughout the development.

6.44 Sustainable Drainage System (SuDS) features have been incorporated within the development which include source control features such as permeable paving to driveways and bioretention planters along the road edge, conveyance swales within verges and detention basins as a site control feature at the end of the management train (update as required).

6.45 The SuDS have been designed for easy maintenance to compromise:

- Regular day to day care in line with soft landscape maintenance requirements elsewhere on site;
- Litter collection/grass cutting, but also to include checking of inlets and outlets of SuDS features;
- Occasional tasks such as managing vegetation and removing any silt that builds up within the features; and
- Remedial work such as repairing damage where necessary.

Swales

6.46 Swales are included within the development. These are shallow features with gentle sloping banks and a flat bottom that have grass to banks to keep a neat and tidy appearance within the development. Wildflower turf to base of swales to provide interception and pollution control, as well as marginal planting. Check dams have been included, due to the level changes along the length of the swale.

Management Objectives

6.47 To maintain a route for the conveyance/storage/infiltration of surface water which slows the flow and deals with pollution, whilst contributing to an attractive setting for the development.

Management Perspective

6.48 Regular tasks to comprise the following:

- Maintain grass banks and access areas around swales through regular cutting to keep grass at 35-50mm minimum and 75mm maximum;
- Remove any litter from banks/base of swale; and

- Wildflower turf to be maintained with two cuts annually in July and September OR one cut annually in September (to be agreed with ecologist);

- Where marsh conditions establish in the base due to wet conditions, cut annually or as required removing to wildlife piles on-site;

- Marginal planting to be allowed to colonise the base of the pond aside from where amenity grass is indicated and public access to be allowed for informal recreation. Should vegetation require cutting back at any time to encourage regrowth from the base, cut to 100mm with cuttings removed to wildlife piles during September/October. Only 25-30% to be cut in any one year;

- Where there is a build-up of silt in the basin which accumulates to more than 150mm, undertake a phased removal of silt subject to client approval. Remove no more than 30% of the area at any one time to an agreed depth but not subsoil layer. Retain as much representative vegetation as possible to ensure rapid recolonisation;

- Spread on-site to an agreed area to top of banks to allow de-watering of silt and then remove in accordance with EA waste exemption guidance. Undertake when ground is damp in autumn or early spring; and

- Should invasive species such as bull rush (*Typha*) self-colonise the basin through natural seed dispersal, do not allow it to colonise more than 50% of the base of the pond to prevent out competing other native species. Undertake removal during September/October to minimise damage to protected species and allow re-growth of other marginal vegetation. Review bi-annually.

Bioretention Planters/Rain Gardens

6.54 Bioretention planters are planted areas with engineered topsoil over drainage layers that allow water to soak into the ground. They have been provided along road verges/to front gardens/adjacent to areas of hard standing within areas of public open space.

Management Objective

6.55 To maintain the feature's ability to provide source control and interception of storm water run-off and to provide treatment and slow flow by providing attenuation, whilst creating attractive planted areas within the development.

Management Prescriptive

6.56 Regular (monthly visit) to comprise the following:

- Remove litter, surface debris and weeds;

- Inspect inlets and outlets for blockage; and

Section 7
Monitoring and Timetable of Works

Monitoring

7.1 The responsibility for the undertakings set out within this LEMP rests with Developer and/or appointed Principal Contractor for the duration of the pre-construction and construction phases.

7.2 Upon completion of development, land ownership and responsibility of managed areas will be transferred to the Private Management Company appointed by the Developer.

7.3 For each phase of development, an assessment of all informal areas of grassland, meadow and bulb planting onsite will be undertaken at years 1, 3 and 5 from the first spring following planting of that phase by the Landscape Architect to ensure the adequate establishment of all plants, identify the presence of any undesirable species and disease and to determine whether remedial action is required, including replacement seeding/bulb planting for any lost/damaged specimens and additional management prescriptions necessary to ensure successful development.

7.4 This is in addition to an assessment of the condition of all retained and newly planted tree, hedge, shrub and scrub plants to be made by a qualified and experienced arboriculturist annually for a period of five years from the first spring following planting of each development phase to ensure the adequate establishment of all plants, identify the presence of any undesirable species and disease and to determine whether remedial action is required, including replacement planting for any lost/damaged specimens and additional management prescriptions necessary to ensure its successful development.

7.5 Copies of monitoring report derived from such actions will be made available to NCC at the end of each monitoring year, as a result of the phased program the last report will be issued to NCC 5 years after completion of the last phase (circa 2031).

7.6 The provisions and responsibilities for this LEMP will be reviewed on an annual basis during the first five years by those responsible for landscape management and maintenance, and every five years thereafter (or as required). Any substantial amendments will be approved in writing by the Local Planning Authority.

Timetable of Works

7.7 The pre-construction works phase has commenced following approval of the planning application, discharge of relevant pre-commencement conditions and approval of a Development Licence from NRW.

Table EDP 7.1: Optimal Timings to Undertake Tasks Anticipated in Relation to Consented Development

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Vegetation clearance – Trees, scrub and shrub[13]	■	■								■	■	■
Tree, shrub and scrub stump removal[14]				■	■	■	■	■	■	■		
Vegetation clearance – grassland[15]				■	■	■	■	■	■			
Installation of tree protection fencing	■	■	■	■	■	■	■	■	■	■	■	■
New tree and shrub planting)	■	■	■								■	■
Seeding: species-rich grassland				■	■				■	■		
Seeding: amenity grassland				■	■				■	■		

Table EDP 7.2: Schedule of Works for Monitoring and Maintenance of Retained and Newly Created Habitats within Consented Development

Task	Frequency	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assessment and remedial works to areas of informal grassland and bulb planting	Years 1, 3 and 5 from the first spring following planting. Every five years thereafter.						■	■					
Inspection, management and remedial works to tree, hedge and shrub planting	Annually for the first five years, with any clearance undertaken outside of bird nesting season. Every five years thereafter.	■	■							■	■	■	■

[13] Outside of bird nesting season unless vegetation is inspected by an ECoW immediately prior to clearance and no active bird nests present.
[14] Assuming hibernating habitats exist and these cannot be reasonably hand searched to confirm likely absence of protected/notable species prior to removal.
[15] Timed to coincide with the active reptile season to enable passive displacement of individuals potentially present. Prior inspection for ground nesting birds by an ECoW immediately prior to clearance is advised to ensure impacts to ground nesting birds are be avoided.

Task	Frequency	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Permanent roosting features (bat tubes and loft void)	Features will be subject to a final check upon completion of construction and prior to handover to the homeowner, by the bat licensed ecologist to ensure that they are incorporated correctly, with any remedial action completed as necessary.												

Section 8
Summary and Conclusions

8.1 This LEMP details the management and maintenance measures specific to consented development considered necessary to protect and conserve the ecological and landscape interest features of the Development Site. Detailed measures have also been provided to ensure that existing and retained features of ecological interest, namely the woodland and trees bounding the development footprint as well as poor semi-improved grassland, are suitably protected during the construction phase of the development.

8.2 Management prescriptions for the maintenance of the viability of retained and newly created habitats located across the development footprint and with respect to the woodland and trees forming the peripheries of the Development Site have been provided, including timings for when operations should occur. Such prescriptions are considered to be in line with the broader recommendations made for the continued long-term maintenance and protection of the Development Site's ecological interests.

8.3 The responsibility of the undertakings set out within this LEMP rests with the Principal Contractor and/or Developer for the pre-construction and construction works phases and for the period up to handover to the Private Management Company. Any deviation from that prescribed within this LEMP is to be agreed in writing with the Local Planning Authority.

Appendix EDP 1
Proposed Site Plan
(Drawing Number: 18137(05) 1101 Rev AA, Powell Dobson, May 2022)

No. of Units	%	House Description	storey height	beds	Gross	Total net
12	8%	LETCHWORTH (TOOLBOX)	2 st	3 bed	984	11,808
20	14%	WARWICK	2 st	3 bed	1080	21,600
12	8%	AMBERLEY	2 st	4 Bed	1136	13,632
21	14%	STRATFORD	2 st	4 Bed	1197	25,137
15	10%	OXFORD+	2 st	4 bed	1340	20,100
15	10%	OXFORD Lifestyle	2 st	3 bed	1340	20,100
18	12%	CAMBRIDGE	2 st	4 bed	1404	25,272
17	11%	WELWYN+	2 st	4 Bed	1557	26,469
13	9%	HENLEY+	2 st	4 Bed	1769	22,997
5	3%	RICHMOND+	2 st	4 bed	2031	10,155
sub total						
148						197,270
Net Developable Area		5.4	hectares			
		13.33	acres			
Density/coverage		14,798.95	Sq ft/acre			
Affordable 'Neutral tenure'						
8		2.1.3 Flat	2 St	1 Bed	556	4,448
4		4.2.2 House	2 St	2 Bed	893	3,572
4		5.3.3 House	2 St	3 Bed	1068	4,272
sub total						
16						12,292
Affordable 'LCHO'						
4		AVON	2 St	2 Bed	635	2,540
2		DART HOUSE	2 St	3 Bed	891	1,782
sub total						
6						4,322
sub total						
22						16614
Net Developable Area		0.4	hectares			
		0.97	acres			
Density/coverage		17,127.84	Sq ft/acre			
SUMMARY TOTAL						
170						
NUMBER OF UNITS					170	Units
COVERAGE					213,884	sq.ft
Net Developable Area		5.8	hectares			
		14.30	acres			
Density/coverage		14,956.92	Sq ft/acre			
		29.41	uph			

CAERLEON CAMPUS: CONVERSIONS WITHIN EXISTING BUILDINGS						
No. of Units	%	House Description	storey	beds	Gross	Total net
MAIN BUILDING						
23		1 bed flats			tbc	tbc
18		2 bed flats			tbc	tbc
1		3 bed flats			tbc	tbc
Listed Building Outbuilding						
2		2 bed flats			tbc	tbc
sub total						
44						tbc
T J WEBLEY						
1		2 bed house			tbc	tbc
1		3 bed house			tbc	tbc
sub total						
2						tbc
Ty HYWEL						
1		1 bed flat			tbc	tbc
1		4 bed house			tbc	tbc
sub total						
2						tbc
FELTHORPE HOUSE						
1		5 bed house			tbc	tbc
					tbc	tbc
TOTAL						
49						tbc
SUMMARY TOTAL NEW BUILD AND CONVERTED UNITS						
OPENMARKET	CONVERTED UNITS			49	49	
	REDROW HERITAGE			148	148	
AFFORDABLE	REDROW AFFORDABLE		10%	22	22	
NUMBER OF UNITS				219 Units	219	Units

Sinks

Issues

Area of open space incorporating exercise trail and landscaping.
(Please refer to EDP plans for details and Quad engineering for further detail)

BROOKLEA

Ty Lyn House

14.1m

46.0m

3m footway/cycleway

ST CADOC'S CLOSE

LODGE ROAD

34.0m

El Sub Sta

Ty Bryn

Spring

Pollards Well

31.6m

Ponds

Listed Building

Listed Building Outbuilding

24 spaces

7 spaces

6 spaces

6 spaces

6 spaces

12 cycle stands

Future cycle stands

Ty Hywell

TJ Webley

LEAP (Detail subject to planning condition)

Public Open Space

Ele Sub Station

Bin Store

Bin Store

LB

Felthorpe

32.4m

31.2m

33.4m

Lichfield

Killarney

West Hill

Westbury

The Grove

Woodlands

COLLEGE CRES

32.0m

Lum

Scale 1:500

0 10 20 50

NORTH

Figured dimensions and levels to be used. Any inaccuracies must be notified to the architect.
Detail drawings and large scale drawings take precedence over smaller drawings.

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Rev:		Chk'd:
K	Plots 1-9 changed. Entrance road re-aligned. Parking amended to north and east of listed building. Cycle stands added to gardens of listed building. AJP 04.08.2020	-
L	Plot 8A housetype changed. Area for future cycle stands and vehicle maintenance zone added by LEAP. Trees removed by Plot 108 and pedestrian route on north-western boundary. Entrance road narrowed. Path added to grounds of listed building. Car charging points indicated to 4 parking spaces by listed building. AMBY, CAMB, LETC, WARW housetypes updated. AJP 04.08.2020	
M	Plots 137-139 Amended. AF 10.09.20	
N	PLots 78-87, 91-98, 159-160 Amended. New attenuation pond. Stairs removed. Northern attenuation pond omitted and path revised to engineers design. ML/AF 05.08.20	
O	Avon house type updated. ML 08.10.20	
P	4.2.2, 5.3.3, Oxford, Oxford Lifestyle, Welwyn & Henley footprints revised. C.L. 20.11.20	
Q	Revised drainage easement between plots 40&41 accommodated AF. 09.12.20	

Rev:		Chk'd:
R	Fire access added to St Cadoc's Close. On-street visitor parking and main road traffic calming added. AF.10/12/20	
S	Sub Station amended and path leading to it added in accordance with instructions from the Client. MB 12.01.21	
T	Amendments to private drives to accommodate engineering fire tracking AF 25.01.21	
U	Amendments to walls on Plots 10,13,15,104,106,130 and 83 in accordance with Clients instructions. MB 02.02.21	
V	Amendments to Letchworths parking and gradens arrangements. Minor boundary and path configurations AF 29.04.21	
W	Sheds removed from Letchworths. AF 29.04.21	
X	Parking numbers revised for numbers 17-24. Enclosures for plots 106-113, 135-139 & 169-170 updated. ML 06.08.21	

Rev:		Chk'd:
Y	Entrance to Plot 140-144 private drive and Lodge Road junction & Western footpath to turning head adj. Plots 72 & 78 amended. Parking to Plots 91 - 193 revised. Private Drive fronting Plot 20 revised & raised tables added to junctions adjacent Plots 127 & 152 and Plots 31 & 44. Water butts added to all Plots. C.L. 21.09.21	
Z	Swale behind Plots 16 & 17 adjusted to avoid RPA of existing trees. Rear boundary to these Plots adjusted accordingly. C.L. 04.10.21	
AA	Bin store sizes revised in accordance with instructions from the Client. MB 03.05.22	

PRELIMINARY	
PLANNING	✓
DESIGN	
TENDER	
CONSTRUCTION	

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Drawing No.	Rev.
18137(05) 1101	AA

Contract: Redrow Homes
Caerleon Campus Redevelopment
Title: Proposed Site Plan

Scale: 1:500@A0
Date: 16/09/2020
Drawn: ML
Checked: AF

Registered Office: Powell Dobson, Suite 1F, Building One, Eastern Business Park, Wern Fawr Lane, Old St. Mellons, Cardiff CF3 5EA. Powell Dobson is a trading name of Powell Dobson Ltd a company registered in England and Wales No 3873802.

A	Plots 27-28 interchanged. Plot 22 Rotated	AF 14.10.2019
B	Highway visibility splays added and minor corresponding amendments	AF 23.10.2019
C	Plot 04 handed; Private drive reduced in length to only serve plots 90-94 ; Parking allocated to apartments in Listed Building and Listed Building Outbuilding,	art 31.10.2019
D	Water main easement added	art 06.11.2019

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BROOKLEA

ROAD

The Cottage

14.1m

Ty Lyn House

26

9

71

LB

No.3 Fagus sylvatica 400-450cm

No.2 Metasequoia glyptostroboides 450-500cm

Note: Exact location and levels of footpath as per Engineering information

No.1 Quercus ilex 450-500cm

No.1 Quercus palustris min. 450cm

No.1 Tilia cordata 'Winter Orange' 400-450cm

No.1 Aesculus hippocastanum 400-450cm

No.3 Salix caprea 350-425cm

Orange' 400-450cm

No.1 Quercus ilex 450-500cm

No.1 Tilia cordata 'Winter Orange' 400-450cm

No.2 Sorbus aria 400-450cm

No.1 Quercus ilex 450-500cm

No.1 Liquidambar styraciflua 450-500cm

'Streetwise' 400-450cm

No.3 Deschampsia cespitosa
No.2 Spiraea nipponica 'Snowmound' 40-60cm
No.6 Cornus sanquinea 40-60cm
No.3 Sarcococca confusa 40-60cm
No.4 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.8 Luzula nivea

No.1 Liriodendron tulipifera 450-500cm

No.1 Betula utilis jacquemontii 300-350cm

No.3 Sorbus aria 400-450cm

No.1 Liriodendron tulipifera 450-500cm

Aquatic/Marginal Mix
No.6 Apium nodiflorum 15%
No.8 Carex acutiformis 20%
No.4 Eleocharis palustris 10%
No.6 Filipendula ulmaria 15%
No.10 Iris pseudacorus 25%
No.6 Mentha aquatica 15%

No.2 Betula utilis jacquemontii 300-350cm

No.1 Betula utilis jacquemontii 300-350cm

No.1 Acer campestre 'Streetwise' 400-450cm

No.14 Deschampsia cespitosa
No.11 Spiraea nipponica 'Snowmound' 40-60cm
No.32 Cornus sanquinea 40-60cm
No.14 Sarcococca confusa 40-60cm
No.18 Crocosmia 'Emily McKenzie'
No.11 Dryopteris filix-mas
No.42 Luzula nivea

No.12 Deschampsia cespitosa
No.9 Spiraea nipponica 'Snowmound' 40-60cm
No.26 Cornus sanquinea 40-60cm
No.12 Sarcococca confusa 40-60cm
No.15 Crocosmia 'Emily McKenzie'
No.9 Dryopteris filix-mas
No.35 Luzula nivea

No.3 Deschampsia cespitosa
No.2 Spiraea nipponica 'Snowmound' 40-60cm
No.6 Cornus sanquinea 40-60cm
No.3 Sarcococca confusa 40-60cm
No.4 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.8 Luzula nivea

No.3 Deschampsia cespitosa
No.2 Spiraea nipponica 'Snowmound' 40-60cm
No.5 Cornus sanquinea 40-60cm
No.3 Sarcococca confusa 40-60cm
No.3 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.7 Luzula nivea

No.9 Deschampsia cespitosa
No.7 Spiraea nipponica 'Snowmound' 40-60cm
No.20 Cornus sanquinea 40-60cm
No.9 Sarcococca confusa 40-60cm
No.11 Crocosmia 'Emily McKenzie'
No.7 Dryopteris filix-mas
No.26 Luzula nivea

No.3 Deschampsia cespitosa
No.2 Spiraea nipponica 'Snowmound' 40-60cm
No.6 Cornus sanquinea 40-60cm
No.3 Sarcococca confusa 40-60cm
No.4 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.8 Luzula nivea

No.2 Liquidambar styraciflua 'Lane Roberts' 400-450cm

No.8 Deschampsia cespitosa
No.6 Spiraea nipponica 'Snowmound' 40-60cm
No.18 Cornus sanquinea 40-60cm
No.8 Sarcococca confusa 40-60cm
No.10 Crocosmia 'Emily McKenzie'
No.6 Dryopteris filix-mas
No.24 Luzula nivea

No.3 Deschampsia cespitosa
No.2 Spiraea nipponica 'Snowmound' 40-60cm
No.6 Cornus sanquinea 40-60cm
No.3 Sarcococca confusa 40-60cm
No.4 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.8 Luzula nivea

No.3 Deschampsia cespitosa

0 10m

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N

- Site Boundary
- Existing Vegetation to be Retained
  Includes RPA shown
  Refer to the Arboricultural Report for details
- Existing Grass to be Retained and Enhanced with Species Rich Grass
  Product: EG6 - Grass Mixture for Hedgerow and Woodland
  Supplier: Emorgate
- Proposed Trees
  (Mature Canopy Extent Illustrated)
- Proposed Translocated Trees
- Proposed Turf
  Product: Medallion Turf
  Supplier: Rolawn
- Proposed Amenity Grass
  Product: EG22 - Strong Lawn Grass Mixture
  Supplier: Emorgate
- Proposed Species Rich Grass
  Product: EL1 Flowering Lawn Mixture
  Supplier: Emorgate
- Proposed Meadow Grassland within Rain Garden
  Product: EG8 Meadow Grass Mixture for Wet Soils/Supplier: Emorgat
- Proposed Meadow Grass Mixture to Ponds and Swales
  EG8 Meadow Grass Mixture for Wet Soils
  Supplier: Emorgate Seeds Sowing rate: 5g/m2
- Proposed Wildflower Turf to base of Swales
  SuDS Turf
  Supplier: Wildflower Turf
- Proposed Aquatic Mix
- Proposed Aquatic-Edge Structural Planting
- Proposed Ornamental Planting
- Proposed Structural Planting
- Proposed Planting Bed
- Proposed Rain Garden Planting
- Proposed Hedgerow
- Proposed Wildflower Grassland
  Product: EM3 - Special General Purpose Meadow Mixture
  Supplier: Emorgate
- Proposed Shade Tolerant Wildflower Grassland and Bulb Planting
  Product: EW1F - Wildflowers for Woodland
  Supplier: Emorgate
- Proposed Gravel Footpath
  Bowston Golden Amber Gravel or similar approved
  For exastinn location and levels refer to Engineering information
- Proposed Location for the Trim Trail Equipment
  Details of Trim Trail Equipment subject to planning conditions
- Proposed Location for the Local Equipped Area for Play (LEAP)
  Details of Local Equipped Area for Play subject to planning conditions
- Proposed Gravel to Front Gardens
  Golden Chippins 20mm or similar
- Proposed Boundary Treatments
  Refer to Architects and Engineers drawings for Boundary Treatments
- Proposed Lighting Column
  Refer to engineer's plans for details
- Location of Underground Services
  Refer to engineer's plans for details
- Easement
  Refer to engineer's plans for details

NOTE:
No planting operations to be undertaken within RPAs for trees designated under a TPO. Refer to arboricultural report and plans for details on locations of such trees.

A risk assessment has been carried out on this drawing in accordance with the hazards identified in the listed below. A copy of the full Design Risk Register is also available on request from EDP.

1. Implementing soft landscape within a construction environment (across the site).
2. Installing trees (across the site).
3. Installing trees on steep slopes (within the area of POS to the north and south).
4. Maintenance to grassed areas on steep slopes (within the area of POS to the north and south).
5. Working near watercourses and pond (across the site).
6. Working within close proximity of underground services (across the site).

For further guidance, refer to HSE Construction (Design and Management) Regulations 2015

overview



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purpose of issue **PLANNING**

RC	Updates following LO comments	12-12-2024	MMm
ab	Updates to details following client comment	18-10-2024	MMm
-	Original	08-10-2020	DR
rev	description	date	by

client
Redrow Homes (South Wales) Ltd

project title
Caerleon University Campus

drawing title
Detailed Soft Landscape Plan

Sheet 2 of 9

date	**12 DECEMBER 2024**	drawn by	**LCH**
drawing number	**edp5603_d025ac**	checked	**DR**
scale	**1:200 @ A1**	QA	**JTF**

the environmental dimension partnership
Registered office: 01285 740427 - www.edp-uk.co.uk - info@edp-uk.co.uk

No.2 Sorbus aria 400-450cm
No.1Quercus ilex 450-500cm
No.1Liquidambar styraciflua 450-500cm
No.2 Acer campestre 'Streetwise' 400-450cm
No.3 Deschampsia cespitosa
No.2 Spiraea nipponica 'Snowmound' 40-60cm
No.6 Cornus sanquinea 40-60cm
No.3 Sarcococca confusa 40-60cm
No.4 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.8 Luzula nivea
No.1Liriodendron tulipifera 450-500cm
No.1Betula utilis jacquemontii 300-350cm
No.3 Sorbus aria 400-450cm
Aquatic/Marginal Mix
No.6 Apium nodiflorum 15%
No.8 Carex acutiformis 20%
No.4 Eleocharis palustris 10%
No.6 Filipendula ulmaria 15%
No.10 Iris pseudacorus 25%
No.6 Mentha aquatica 15%
No.2 Betula utilis jacquemontii 300-350cm
No.14 Deschampsia cespitosa
No.11 Spiraea nipponica 'Snowmound' 40-60cm
No.32 Cornus sanquinea 40-60cm
No.14 Sarcococca confusa 40-60cm
No.18 Crocosmia 'Emily McKenzie'
No.11 Dryopteris filix-mas
No.42 Luzula nivea
No.12 Deschampsia cespitosa
No.9 Spiraea nipponica 'Snowmound' 40-60cm
No.26 Cornus sanquinea 40-60cm
No.12 Sarcococca confusa 40-60cm
No.15 Crocosmia 'Emily McKenzie'
No.9 Dryopteris filix-mas
No.35 Luzula nivea
No.1Acer campestre 'Streetwise' 400-450cm
No.2 Liquidambar styraciflua 'Lane Roberts' 400-450cm
No.8 Deschampsia cespitosa
No.8 Spiraea nipponica 'Snowmound' 40-60cm
No.18 Cornus sanquinea 40-60cm
No.8 Sarcococca confusa 40-60cm
No.10 Crocosmia 'Emily McKenzie'
No.6 Dryopteris filix-mas
No.24 Luzula nivea
No.15 Aucuba japonica 'Rozannie' 20% 30-40cm
No.15 Choisya 'Aztec Pearl' 20% 40-60cm
No.15 Hebe rakaiensis 20% 40-60cm
No.15 Hypericum 'Hidcote' 20% 30-40cm
No.15 Lonicera pileata 20% 30-40cm
No.69 Aucuba japonica 'Rozannie' 20% 30-40cm
No.69 Choisya 'Aztec Pearl' 20% 40-60cm
No.69 Hebe rakaiensis 20% 40-60cm
No.69 Hypericum 'Hidcote' 20% 30-40cm
No.69 Lonicera pileata 20% 30-40cm
No.2 Aesculus hippocastanum 400-450cm
No.2 Salix caprea 350-425cm
No.1Salix caprea 350-425cm
No.2 Alnus glutinosa 350-400cm
No.48 Ligustrum vulgare 80-100cm
No.43 Ligustrum vulgare 80-100cm
TRANSLOCATED Refer to Drawing edp5601_d027
No.4 Magnolia grandiflora 350-425cm
No.153 Lonicera nitida 60-80cm
No.10 Euonymus fortunei 'Silver Queen' 20% 20-30cm
No.10 Hebe 'Great Orme' 20% 30-40cm
No.14 Lonicera pileata 30% 30-40cm
No.5 Mahonia aquifolium 'Apollo' 10% 20-30cm
No.10 Viburnum davidii 20% 30-40cm
Bin Store
Elec Sub Station
Listed Building Outbuilding
LB
71
N

Site Boundary
Existing Vegetation to be Retained
Inlcudes RPA shown
Refer to the Arboricultural Report for details
Existing Grass to be Retained and Enhanced with Species Rich Grass
Product: EG6 - Grass Mixture for Hedgerow and Woodland
Supplier: Emorsgate
Proposed Trees
(Mature Canopy Extent Illustrated)
Proposed Translocated Trees
Proposed Turf
Product: Medallion Turf
Supplier: Rolawn
Proposed Amenity Grass
Product: EG22 - Strong Lawn Grass Mixture
Supplier: Emorsgate
Proposed Species Rich Grass
Product: EL1 Flowering Lawn Mixture
Supplier: Emorsgate
Proposed Meadow Grassland within Rain Garden
Product: EG8 Meadow Grass Mixture for Wet Soils
Supplier: Emorsgate
Proposed Meadow Grass Mixture to Ponds and Swales
EG8 Meadow Grass Mixture for Wet Soils
Supplier: Emorsgate Seeds Sowing rate: 5g/m2
Proposed Wildflower Turf to base of Swales
SuDS Turf
Supplier: Wildflower Turf
Proposed Aquatic Mix
Proposed Aquatic-Edge Structural Planting
Proposed Ornamental Planting
Proposed Structural Planting
Proposed Planting Bed
Proposed Rain Garden Planting
Proposed Hedgerow
Proposed Wildflower Grassland
Product: EM3 - Special General Purpose Meadow Mixture
Supplier: Emorsgate
Proposed Shade Tolerant Wildflower Grassland and Bulb Planting
Product: EW1F - Wildflowers for Woodland
Supplier: Emorsgate
Proposed Gravel Footpath
Breedon Golden Amber Gravel or similar approved
For exaction locations and levels refer to Engineering information
Proposed Location for the Trim Trail Equipment
Details of Trim Trail Equipment subject to planning conditions
Proposed Location for the Local Equipped Area for Play (LEAP)
Details of Local Equipped Area for Play subject to planning conditions
Proposed Gravel to Front Gardens
Golden Chippins 20mm or similar
Proposed Boundary Treatments
Refer to Architects and Engineers drawings for Boundary Treatments
Proposed Lighting Column
Refer to engineer's plans for details
Location of Underground Services
Refer to engineer's plans for details
Easement
Refer to engineer's plans for details

NOTE:
No planting operations to be undertaken within RPAs for trees designated under a TPO. Refer to arboricultural report and plans for details on locations of such trees.

RISK ASSESSMENT
A risk assessment has been carried out on this design. Residual risks following this process are listed below. A copy of the full Design Risk Register is also available on request from EDP.
1. Implementing soft landscape within a construction environment (across the site);
2. Working at height (across the site);
3. Installing trees on steep slopes within the area of POS to the north and south);
4. Installing shrubs on grassed areas on steep slopes (within the area of POS to the north and south);
5. Water body (swales and pond across the site);
6. Working within close proximity of underground services (across the site).
For further guidance, refer to HSE Construction (Design and Management) Regulations 2015.

overview


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purpose of issue **PLANNING**

ac	Updates following LO comments	12-12-2024	MMm
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client
Redrow Homes (South Wales) Ltd

project title
Caerleon University Campus

drawing title
Detailed Soft Landscape Plan

Sheet 4 of 9

date	**12 DECEMBER 2024**	drawn by	**LCH**
drawing number	**edp5601_d025ac**	checked	**DR**
scale	**1:200 @ A1**	QA	**JTF**

the environmental dimension partnership
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Listed Building Outbuilding

Listed Building

No.15 Aucuba japonica 'Rozannie' 20% 30-40cm
No.15 Choisya 'Aztec Pearl' 20% 40-60cm
No.15 Hebe rakaiensis 20% 40-60cm
No.15 Hypericum 'Hidcote' 20% 30-40cm
No.15 Lonicera pileata 20% 30-40cm

No.153 Lonicera nitida 60-80cm

No.10 Euonymus fortunei 'Silver Queen' 20% 20-30cm
No.10 Hebe 'Great Orme' 20% 30-40cm
No.14 Lonicera pileata 30% 30-40cm
No.5 Mahonia aquifolium 'Apollo' 10% 20-30cm
No.10 Viburnum davidii 20% 30-40cm

No.10 Euonymus fortunei 'Silver Queen' 20% 20-30cm
No.10 Hebe 'Great Orme' 20% 30-40cm
No.14 Lonicera pileata 30% 30-40cm
No.5 Mahonia aquifolium 'Apollo' 10% 20-30cm
No.10 Viburnum davidii 20% 30-40cm

No.10 Euonymus fortunei 'Silver Queen' 20% 20-30cm
No.10 Hebe 'Great Orme' 20% 30-40cm
No.14 Lonicera pileata 30% 30-40cm
No.5 Mahonia aquifolium 'Apollo' 10% 20-30cm
No.10 Viburnum davidii 20% 30-40cm

No.4 Carpinus betulus 'Frans Fontaine' 400-450cm

No.2 Liquidambar styraciflua 450-500cm

No.113 Lonicera nitida 60-80cm

Existing Species to be Supplemented with same Species Where Necessary

Existing Species to be Supplemented with same Species Where Necessary

Existing Species to be Supplemented with same Species Where Necessary

Existing Species to be Supplemented with same Species Where Necessary

No.4 Carpinus betulus 'Frans Fontaine' 400-450cm

No.46 Lonicera nitida 60-80cm

No.102 Lonicera nitida 60-80cm

No.11 Lonicera nitida 60-80cm

No.107 Lonicera nitida 60-80cm

No.46 Lonicera nitida 60-80cm

No.12 Lonicera nitida 60-80cm

No.2 Liquidambar styraciflua 450-500cm

No.127 Lonicera nitida 60-80cm

No.3 Prunus avium 'Plena' 350-425cm

No.4 Choisya 'Aztec Pearl' 40-60cm
No.3 Deschampsia cespitosa
No.6 Echinops ritro
No.9 Geranium macrorrhizum
No.8 Hebe rakaiensis 40-60cm
No.6 Lavandula angustifolia 40-60cm
No.3 Polemonium caeruleum
No.6 Rudbeckia fulgida sullivantii 'Goldsturm'
No.3 Stipa gigantea

No.2 Carpinus betulus 'Frans Fontaine' 400-450cm

No.2 Liquidambar styraciflua 450-500cm

No.17 Aucuba japonica 'Rozannie' 20% 30-40cm
No.17 Choisya 'Aztec Pearl' 20% 40-60cm
No.17 Hebe rakaiensis 20% 40-60cm
No.17 Hypericum 'Hidcote' 20% 30-40cm
No.17 Lonicera pileata 20% 30-40cm

No.14 Choisya 'Aztec Pearl' 40-60cm
No.11 Deschampsia cespitosa
No.21 Echinops ritro
No.31 Geranium macrorrhizum
No.28 Hebe rakaiensis 40-60cm
No.21 Lavandula angustifolia 40-60cm
No.11 Polemonium caeruleum
No.21 Rudbeckia fulgida sullivantii 'Goldsturm'
No.8 Stipa gigantea

No.7 Choisya 'Aztec Pearl' 40-60cm
No.5 Deschampsia cespitosa
No.10 Echinops ritro
No.15 Geranium macrorrhizum
No.14 Hebe rakaiensis 40-60cm
No.10 Lavandula angustifolia 40-60cm
No.5 Polemonium caeruleum
No.10 Rudbeckia fulgida sullivantii 'Goldsturm'
No.4 Stipa gigantea

No.2 Carpinus betulus 'Frans Fontaine' 400-450cm

No.2 Carpinus betulus 'Frans Fontaine' 400-450cm

No.2 Liquidambar styraciflua 450-500cm

No.2 Carpinus betulus 'Frans Fontaine' 400-450cm

No.2 Carpinus betulus 'Frans Fontaine' 400-450cm

No.2 Carpinus betulus 'Frans Fontaine' 400-450cm

No.2 Carpinus betulus 'Frans Fontaine' 400-450cm

No.2 Acer campestre 'Streetwise' 400-450cm

No.3 Deschampsia cespitosa
No.2 Spiraea nipponica 'Snowmound' 40-60cm
No.6 Cornus sanquinea 40-60cm
No.3 Sarcococca confusa 40-60cm
No.4 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.8 Luzula nivea

No.7 Deschampsia cespitosa
No.5 Spiraea nipponica 'Snowmound' 40-60cm
No.15 Cornus sanquinea 40-60cm
No.7 Sarcococca confusa 40-60cm
No.9 Crocosmia 'Emily McKenzie'
No.5 Dryopteris filix-mas
No.20 Luzula nivea

No.1 Salix caprea 350-425cm

No.2 Alnus glutinosa 350-400cm

No.1 Salix caprea 350-425cm

Aquatic/Marginal Mix
No.7 Apium nodiflorum 15%
No.10 Carex acutiformis 20%
No.5 Eleocharis palustris 10%
No.7 Filipendula ulmaria 15%
No.12 Iris pseudacorus 25%
No.7 Mentha aquatica 15%

Aquatic/Marginal Mix
No.6 Apium nodiflorum 15%
No.8 Carex acutiformis 20%
No.4 Eleocharis palustris 10%
No.6 Filipendula ulmaria 15%
No.10 Iris pseudacorus 25%
No.6 Mentha aquatica 15%

No.1 Acer campestre 'Streetwise' 400-450cm

Aquatic/Marginal Mix
No.6 Apium nodiflorum 15%
No.8 Carex acutiformis 20%
No.4 Eleocharis palustris 10%
No.6 Filipendula ulmaria 15%
No.10 Iris pseudacorus 25%
No.6 Mentha aquatica 15%

Aquatic/Marginal Mix
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Aquatic/Marginal Mix
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No.5 Eleocharis palustris 10%
No.8 Filipendula ulmaria 15%
No.12 Iris pseudacorus 25%
No.8 Mentha aquatica 15%

No.3 Alnus glutinosa 350-400cm

No.3 Deschampsia cespitosa
No.2 Spiraea nipponica 'Snowmound' 40-60cm
No.5 Cornus sanquinea 40-60cm
No.3 Sarcococca confusa 40-60cm
No.3 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.7 Luzula nivea

No.3 Deschampsia cespitosa
No.3 Spiraea nipponica 'Snowmound' 40-60cm
No.7 Cornus sanquinea 40-60cm
No.3 Sarcococca confusa 40-60cm
No.4 Crocosmia 'Emily McKenzie'
No.3 Dryopteris filix-mas
No.9 Luzula nivea

No.2 Deschampsia cespitosa
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No.4 Cornus sanquinea 40-60cm
No.2 Sarcococca confusa 40-60cm
No.3 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.6 Luzula nivea

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No.2 Sarcococca confusa 40-60cm
No.3 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.6 Luzula nivea

No.1 Acer campestre 'Streetwise' 400-450cm

No.2 Deschampsia cespitosa
No.2 Spiraea nipponica 'Snowmound' 40-60cm
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No.2 Sarcococca confusa 40-60cm
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No.2 Deschampsia cespitosa
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No.3 Crocosmia 'Emily McKenzie'
No.2 Dryopteris filix-mas
No.6 Luzula nivea

No.4 Deschampsia cespitosa
No.3 Spiraea nipponica 'Snowmound' 40-60cm
No.9 Cornus sanquinea 40-60cm
No.4 Sarcococca confusa 40-60cm
No.5 Crocosmia 'Emily McKenzie'
No.3 Dryopteris filix-mas
No.12 Luzula nivea

Turf
Area = 6m² Rolawn Medallion

Turf
Area = 8m² Rolawn Medallion

Turf
Area = 17m² Rolawn Medallion

Turf
Area = 30m² Rolawn Medallion

Turf
Area = 15m² Rolawn Medallion

Turf
Area = 17m² Rolawn Medallion

Turf
Area = 13m² Rolawn Medallion

12 cycle stands

6 spaces

VIS

LEAP subject to planning

N

Site Boundary

Existing Vegetation to be Retained
Including RPA shapes
Refer to the Arboricultural Report for details

Existing Grass to be Retained and Enhanced with Species Rich Grass
Product: EG6 - Grass Mixture for Hedgerow and Woodland
Supplier: Emorsgate

Proposed Trees
(Mature Canopy Extent Illustrated)

Proposed Translocated Trees

Proposed Turf
Product: Medallion Turf
Supplier: Rolawn

Proposed Amenity Grass
Product: EG22 - Strong Lawn Grass Mixture
Supplier: Emorsgate

Proposed Species Rich Grass
Product: EL1 Flowering Lawn Mixture
Supplier: Emorsgate

Proposed Meadow Grassland within Rain Garden
Product: EG8 Meadow Grass Mixture for Wet Soils/Supplier: Emorsgate

Proposed Meadow Grass Mixture to Ponds and Swales
EG8 Meadow Grass Mixture for Wet Soils
Supplier: Emorsgate Seeds Sowing rate: 5g/m2

Proposed Wildflower Turf to base of Swales
SuDS Turf
Supplier: Wildflower Turf

Proposed Aquatic Mix

Proposed Aquatic-Edge Structural Planting

Proposed Ornamental Planting

Proposed Structural Planting

Proposed Planting Bed

Proposed Rain Garden Planting

Proposed Hedgerow

Proposed Wildflower Grassland
Product: EM3 - Special General Purpose Meadow Mixture
Supplier: Emorsgate

Proposed Shade Tolerant Wildflower Grassland and Bulb Planting
Product: EW1F - Wildflowers for Woodland
Supplier: Emorsgate

Proposed Gravel Footpath
Breedon Golden Amber Gravel or similar approved
For exaction location and levels refer to Engineering information

Proposed Location for the Trim Trail Equipment
Details of Trim Trail Equipment subject to planning conditions

Proposed Location for the Local Equipped Area for Play (LEAP)
Details of Local Equipped Area for Play subject to planning conditions

Proposed Gravel to Front Gardens
Golden Chippins 20mm or similar

Proposed Boundary Treatments
Refer to Architects and Engineers drawings for Boundary Treatments

Proposed Lighting Column
Refer to engineer's plans for details

Location of Underground Services
Refer to engineer's plans for details

Easement
Refer to engineer's plans for details

NOTE:
No planting operations to be undertaken within RPAs for trees designated under a TPO. Refer to arboricultural report and plans for details on locations of such trees.

CDM

A risk assessment has been carried out on this design. Residual risks following this process are listed below. A copy of the full Design Risk Register is also available on request from EDP.

1. Implementing soft landscape within a construction environment (across the site).
2. Installing trees (across the site).
3. Installing trees on steep slopes (within the area of POS to the north and south).
4. Maintenance to grassed areas on steep slopes (within the area of POS to the north and south).
5. Water body (wastes and pond across the site).
6. Working within close proximity of underground services (across the site).

For further guidance, refer to HSE Construction (Design and Management) Regulations 2015.

overview



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purpose of issue **PLANNING**

#	description	date	by
#C	Updates following LD comments	12-12-2024	MMm
aC	Updates to details following client comment	18-10-2024	MMm
-	Original	08-10-2020	DR

client
Redrow Homes (South Wales) Ltd

project title
Caerleon University Campus

drawing title
Detailed Soft Landscape Plan

Sheet 6 of 9

date	12 DECEMBER 2024	drawn by	LCH
drawing number	edp5603_d025ac	checked	DR
scale	1:200 @ A1	QA	JTF

the environmental dimension partnership
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Site Boundary

Existing Vegetation to be Retained
Woodland RPA shown.
Refer to the Arboricultural Report for details

Existing Grass to be Retained and Enhanced with Species Rich Grass
Product: EG6 - Grass Mixture for Hedgerow and Woodland
Supplier: Emorgate

Proposed Trees
(Mature Canopy Extent Illustrated)

Proposed Translocated Trees

Proposed Turf
Product: Medallion Turf
Supplier: Rolawn

Proposed Amenity Grass
Product: EG22 - Strong Lawn Grass Mixture
Supplier: Emorgate

Proposed Species Rich Grass
Product: EL1 Flowering Lawn Mixture
Supplier: Emorgate

Proposed Meadow Grassland within Rain Garden
Product: EG8 Meadow Grass Mixture for Wet Soils
Supplier: Emorgate

Proposed Meadow Grass Mixture to Ponds and Swales
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Proposed Wildflower Turf to base of Swales
SuDS Turf
Supplier: Wildflower Turf

Proposed Aquatic Mix

Proposed Aquatic-Edge Structural Planting

Proposed Ornamental Planting

Proposed Structural Planting

Proposed Planting Bed

Proposed Rain Garden Planting

Proposed Hedgerow

Proposed Wildflower Grassland
Product: EM3 - Special General Purpose Meadow Mixture
Supplier: Emorgate

Proposed Shade Tolerant Wildflower Grassland and Bulb Planting
Product: EW1F - Wildflowers for Woodland
Supplier: Emorgate

Proposed Gravel Footpath
Breedon Golden Amber Gravel or similar approved
For exastion blockwork levels refer to Engineering information.

Proposed Location for the Trim Trail Equipment
Details of Trim Trail Equipment subject to planning conditions

Proposed Location for the Local Equipped Area for Play (LEAP)
Details of Local Equipped Area for Play subject to planning conditions

Proposed Gravel to Front Gardens
Golden Chippins 20mm or similar

Proposed Boundary Treatments
Refer to Architects and Engineers drawings for Boundary Treatments

Proposed Lighting Column
Refer to engineer's plans for details

Location of Underground Services
Refer to engineer's plans for details

Easement
Refer to engineer's plans for details

NOTE:
No planting operations to be undertaken within RPAs for trees designated under a TPO. Refer to arboricultural report and plans for details on locations of such trees.

A risk assessment has been carried out on this design. Residual risks following this process are listed below. A copy of the full Design Risk Register is also available on request from EDP.

1. Implementing soft landscape within a construction environment (across the site);
2. Working at height (across the site);
3. Installing trees on steep slopes (within the area of POS to the north and south);
4. Maintenance to grassed areas on steep slopes (within the area of POS to the north and south);
5. Working near to water (within and across the site);
6. Working within close proximity of underground services (across the site).

For further guidance, refer to HSE Construction (Design and Management) Regulations 2015.

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purpose of issue **PLANNING**

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-	Original	08-10-2020	DR

client
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project title
Caerleon University Campus

drawing title
Detailed Soft Landscape Plan

Sheet 8 of 9

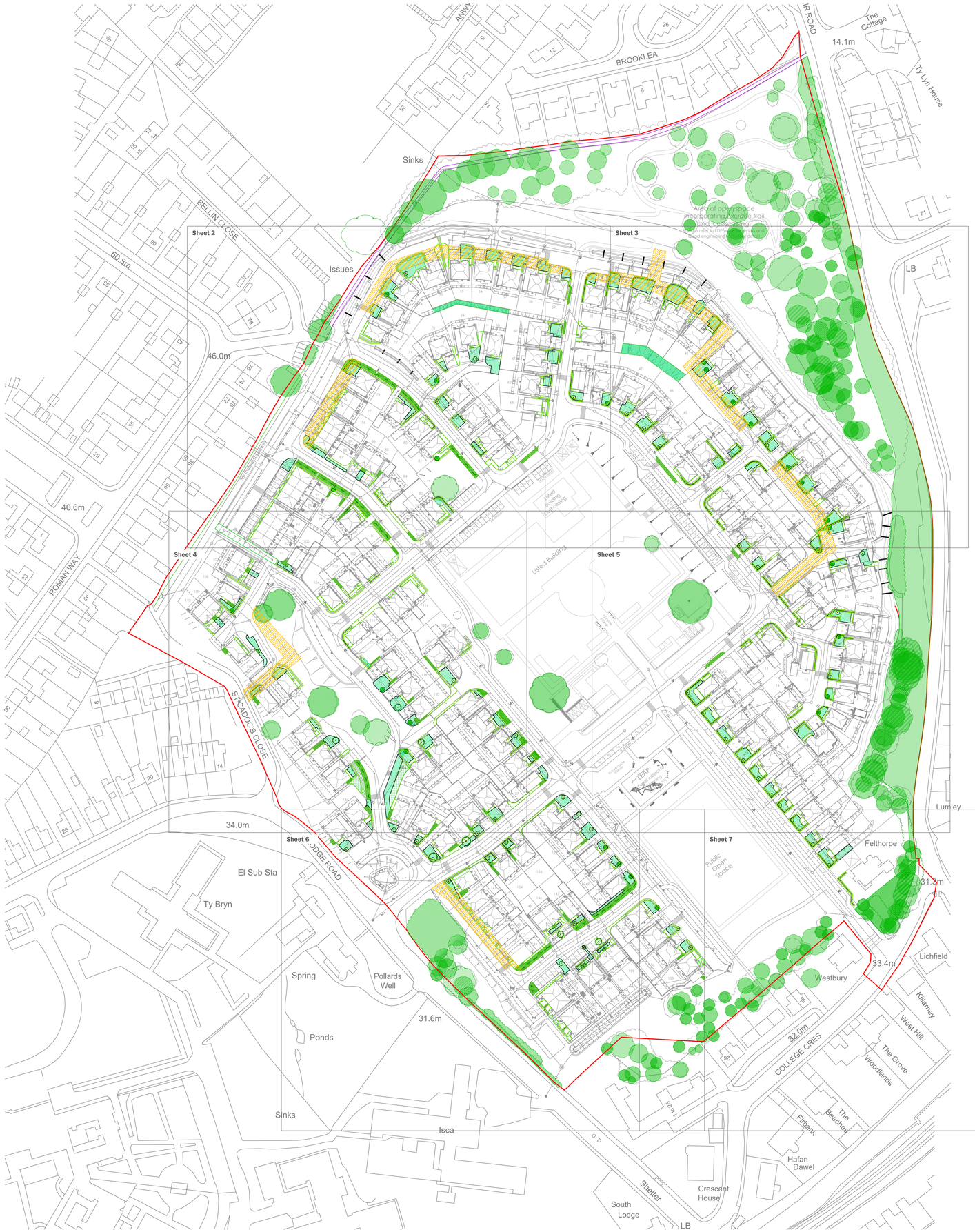
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drawing number	**edp5601_d025ac**	checked	**DR**
scale	**1:200 @ A1**	QA	**JTF**

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Appendix EDP 3
Detailed Landscape Proposals for the Residential Plots (edp5601_d031z 12 December 2024 LCH/DR)

NOTE:
No planting operations to be undertaken within RPAs for trees designated under a TPO. Refer to arboricultural report and plans for details on locations of such trees.



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purpose of issue **PLANNING**

rev	description	date	by
E	Updates following LO comments	12-12-2024	MMm
D	Updates to details following client comment	18-10-2024	MMm
C	Original	14-08-2020	DR

client
Redrow Homes (South Wales) Ltd

project title
Caerleon University Campus

drawing title
Detailed Landscape Proposals for the Residential Plots
Sheet 1 of 8

date	**12 DECEMBER 2024**	drawn by	**LCH**
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and landscaping.
(Please refer to EDP plans for details and Quad engineering for further detail)

LB

Listed Building Outbuilding

Bin Store

Elec. Sub Station

2 spaces

20 spaces

VIS

VIS

Site Boundary

Existing Vegetation to be Retained
Indicative RPA shown
Refer to the Arboricultural Report for details

Proposed Trees
(Mature Canopy Extent Illustrated)

Proposed Specimen Shrub Planting

Proposed Turf
Product: Medallion Turf
Supplier: Rolawn

Proposed Planting Bed

Proposed Ornamental Planting

Proposed Rain Garden Planting

Proposed Ground Cover Planting with Bank Stabilisation
Refer to Engineers drawing for soil stabilisation detail.
Product: Macmat 19.1
Supplier: Maccaferri

Proposed Hedgerow

Proposed Gravel
Golden Chippins 20mm or similar

Boundary Treatements
Refer to Architects and Engineers drawings for details

Proposed Lighting Column
Refer to engineer's plans for details

Location of Underground Services
Refer to engineer's plans for details, engineers to review proposed tree locations.

Easement
Refer to engineer's plans for details

For proposed Public Open Space landscape proposals refer to drawing edp5601_d025.

NOTE:
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overview

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Z	Updates following LO comments	12-12-2024	MMm
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-	Original	14-08-2020	DR

client
Redrow Homes (South Wales) Ltd

project title
Caerleon University Campus

drawing title
Detailed Landscape Proposals for the Residential Plots

Sheet 3 of 8

date	**12 DECEMBER 2024**	drawn by	**LCH**
drawing number	**edp5601_d031z**	checked	**DR**
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Proposed Specimen Shrub Planting

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purpose of issue **PLANNING**

rev	description	date	by
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D	updates to details following client comment	18.10.2024	MMm
C	Original	14.08.2020	DR

client
Redrow Homes (South Wales) Ltd

project title
Caerleon University Campus

drawing title
Detailed Landscape Proposals for the Residential Plots

Sheet 5 of 8

date	**12 DECEMBER 2024**	drawn by	**LCH**
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Planting Schedule

Trees

Number	Common Name	Species	Girth	Height	Specification	Density
1	Field Maple 'Streetwise'	Acer campestre 'Streetwise'	12-14cm	400-450cm	Half Standard :Clear Stem min. 200 :3x :RB	Counted
2		Betula 'Edinburgh'	12-14cm	350-425cm	Extra Heavy Standard :Clear Stem min. 200 :RB	Counted
1	Hornbeam 'Frans Fontaine'	Carpinus betulus 'Frans Fontaine'	16-18cm	400-450cm	BR :Extra Heavy Standard :Clear Stem min. 200	Counted
9		Cercis siliquastrum f. albida		100-125cm	Bushy :3 brks	Counted
5	Star magnolia	Magnolia stellata	12-14cm	350-425cm	Heavy Standard :Clear Stem min. 200 :RB	Counted
16	Crab Apple 'Evereste'	Malus 'Evereste'	12-14cm	350-425cm	Heavy Standard :Clear Stem min. 200 :RB	Counted
2		Malus domestica 'John Downie'	8-10cm		RB :Standard :Clear Stem 175-200 :3 brks	Counted
2	Flowering Cherry	Prunus 'Amanogawa'	12-14cm	350-425cm	Heavy Standard :Clear Stem 175-200 :5 brks :3x :RB	Counted
3	Sargent Cherry 'Rancho'	Prunus sargentii 'Rancho'	12-14cm		RB :Heavy Standard :Clear Stem 175-200	Counted
17	European mountain ash	Sorbus aucuparia	12-14cm		RB :Heavy Standard :Clear Stem 175-200	Counted

Total :58

Shrubs

Number	Common Name	Species	Height	Pot Size	Specification	Density
21	Japanese Laurel 'Rozannie'	Aucuba japonica 'Rozannie'	30-40cm	3L	Bushy :C	3/m²
330		Aucuba japonica 'Rozannie'	40-60cm	5L	Branched :5 brks :C	4/m²
78	Shrub Ragwort	Brachyglottis 'Sunshine'	40-60cm	5-7.5L	C :Branched :5/6 brks	4/m²
3	Californian Lilac 'Burkwoodii'	Ceanothus 'Burkwoodii'	150-175cm	25L	C :Caned Leader With Laterals :6/9 brks	Counted
530	Creeping Blueblossom	Ceanothus thyrsiflorus repens	40-60cm	5L	Bushy :5 brks	4/m²
21	Mexican Orange Blossom 'Aztec Pearl'	Choisya 'Aztec Pearl'	40-60cm	5L	Bushy :5 brks	3/m²
39	Mexican Orange Blossom 'Aztec Pearl'	Choisya 'Aztec Pearl'	40-60cm	5L	Bushy :5 brks	4/m²
385	Mexican Orange Blossom	Choisya ternata	40-60cm	5L	Bushy :5 brks	4/m²
73	Mexican Orange Blossom 'Sundance'	Choisya ternata 'Sundance'	40-60cm	5L	Bushy :5 brks	4/m²
66	Silver Dogwood	Cornus alba 'Elegantissima'	80-100cm	10L	Branched :5 brks	Counted
190	Westonbirt Dogwood	Cornus alba 'Sibirica'	40-60cm	2L	Leader With Laterals	4/m²
280	Elaeagnus	Elaeagnus ebbingei	30-40cm	5L	Bushy :7 brks	4/m²
245	Euonymus 'Emerald Gaiety'	Euonymus fortunei 'Emerald Gaiety'	40-60cm	5L	Bushy :7 brks	4/m²
586	Euonymus 'Silver Queen'	Euonymus fortunei 'Silver Queen'	30-40cm	5L	Bushy :7 brks	4/m²
68		Euphorbia amygdaloides robbiae		2L	Full Pot	6/m²
172	Witch Hazel 'Pallida'	Hamamelis intermedia 'Pallida'	30-40cm	5L	Bushy :7 brks	4/m²
109	Shrubby Veronica 'Amy'	Hebe 'Amy'	30-40cm	3L	Bushy :C	4/m²
413	Shrubby Veronica 'Great Orme'	Hebe 'Great Orme'	30-40cm	5L	Bushy :5 brks	4/m²
506		Hebe albicans 'Red Edge'	40-60cm	2L	Bushy :3 brks	3/m²
21	a Shrubby Veronica	Hebe rakaiensis	40-60cm	5L	Bushy :5 brks	3/m²
76	a Shrubby Veronica	Hebe rakaiensis	40-60cm	5L	Bushy :5 brks	4/m²
337	Sevenbark 'Annabelle'	Hydrangea arborescens 'Annabelle'	40-60cm	5L	Branched :C	4/m²
169		Hydrangea quercifolia 'Snow Queen'	40-60cm	5L	Branched :5 brks	4/m²
21	St John's Wort 'Hidcote'	Hypericum 'Hidcote'	30-40cm	3L	Bushy :C	3/m²
220		Ilex crenata 'Convexa'	30-40cm	5L	Bushy : 5 brks	4/m²
286	Box-leaved Holly 'Golden Gem'	Ilex crenata 'Golden Gem'	30-40cm	5L	Bushy :3 brks	4/m²
5	Bay Laurel	Laurus nobilis		25L	Ball on stem; Topiary Quarter Standard; ball diameter 50cm; clear stem 50cm; neatly clipped	Counted
57	English Lavender	Lavandula angustifolia	40-60cm	5L	Branched :5 brks	4/m²
278	Lavender 'Hidcote'	Lavandula angustifolia 'Hidcote'	30-40cm	5L	Bushy :7 brks	4/m²
531	Common Privet	Ligustrum vulgare	60-80cm	3L	Branched :4 brks	4/m²
601	Box-leaf Honeysuckle	Lonicera pileata	30-40cm	7.5L	Bushy :6/9 brks	4/m²
21	Privet Honeysuckle	Lonicera pileata	30-40cm	7.5L	Bushy :6/9 brks	3/m²
617	Oregon Grape 'Apollo'	Mahonia aquifolium 'Apollo'	40-60cm	5L	Bushy :C	4/m²
68	Japanese Spurge	Pachysandra terminalis		2L	Several shoots :7 brks	6/m²
35	New Zealand Flax 'Sundowner'	Phormium 'Sundowner'	40-60cm	10-15L	Triple crown	4/m²
2	Christmas Berry 'Red Robin'	Photinia x fraseri 'Red Robin'		18L	Half Standard; bushy head	Counted
138	Kohuhu 'Tom Thumb'	Pittosporum tenuifolium 'Tom Thumb'	30-40cm	5L	Bushy :5 brks	4/m²
2	Portugal Laurel	Prunus lusitanica	100-125cm		RB :Bushy :7/10 brks	Counted
94	Rosemary	Rosmarinus officinalis	40-60cm	5L	Bushy :5 brks	4/m²
330	Sweet Box	Sarcococca confusa	30-40cm	5L	Bushy :3 brks	4/m²
5	Lilac 'Charles Joly'	Syringa vulgaris 'Charles Joly'	80-100cm	15L	Branched :5/6 brks	Counted
1047	Viburnum	Viburnum davidii	40-60cm	5L	Bushy :C	4/m²
69	Big periwinkle	Vinca major	10-20cm	2L	Bushy :7 brks	6/m²

Total :9145

Herbaceous

Number	Common Name	Species	Height	Pot Size	Specification	Density
51	Bronze Bugle	Ajuga reptans 'Atropurpurea'		3L	Full Pot	6/m²
29	Tufted Hair Grass	Deschampsia cespitosa		3L	Full Pot	4/m²
57	Globe thistle	Echinops ritro		3L	Full Pot	6/m²
418		Euphorbia martinii		2L	Full Pot	3/m²
86	Balkan Cranesbill	Geranium macrorrhizum		3L	Full Pot	6/m²
280	Cranesbill Rozanne	Geranium Rozanne		2L	Full Pot	3/m²
13	Lenten Rose	Helleborus orientalis		3L	Full Pot	6/m²
51		Liriope muscari 'Variegata'		3L	Full Pot	6/m²
109	Catmint 'Six Hills Giant'	Nepeta 'Six Hills Giant'		3L	Full Pot	6/m²
192		Persicaria amplexicaulis 'Firetail'		2L	Full Pot	3/m²
29		Polemonium caeruleum		3L	Full Pot	6/m²
192	Black-eyed Susan 'Goldsturm'	Rudbeckia fulgida sullivantii 'Goldsturm'		2L	Full Pot	3/m²
57	Black-eyed Susan 'Goldsturm'	Rudbeckia fulgida sullivantii 'Goldsturm'		3L	Full Pot	6/m²
133		Sisyrinchium striatum		2L	Full Pot	2/m²
22	Giant Feather Grass	Stipa gigantea		3L	Full Pot	3/m²

Total :1719

Climbers

Number	Common Name	Species	Pot Size	Specification	Density
541	Ivy 'Green Ripple'	Hedera helix 'Green Ripple'	2L	Several Shoots :3 brks	8/m²

Total :541

Ferns

Number	Common Name	Species	Pot Size	Specification	Density
57	Common Male Fern	Dryopteris filix-mas	2L	Full Pot	5/m²
418	Common Polypody	Polypodium vulgare	2L	Full Pot	3/m²

Total :475

Grasses

Number	Common Name	Species	Specification	Density
155	Tufted Hair Grass 'Goldtau'	Deschampsia cespitosa 'Goldtau'	Full Pot	Counted
57	Golden Hakone Grass	Hakonechloa macra 'Aureola'	Full Pot	5/m²
506	Mexican Feather Grass	Stipa tenuissima	Full Pot	3/m²

Total :718

Hedges

Number	Common Name	Species	Height	Specification	Density
803	Field Maple	Acer campestre	60-80cm	Whip	0.3Ctr Double Staggered at 0.5m offset
1329	Common Hornbeam	Carpinus betulus	60-80cm	Whip	0.3Ctr Double Staggered at 0.5m offset
538	Common Holly	Ilex aquifolium	60-80cm	Whip	0.3Ctr Double Staggered at 0.5m offset
886	Common Privet	Ligustrum vulgare	60-80cm	Branched :4 brks	0.3Ctr
1262	Common Privet	Ligustrum vulgare	80-100cm	B; 1+2; Transplant - seed raised	0.3Ctr
1471	Christmas Berry 'Red Robin'	Photinia fraseri 'Red Robin'	30-40cm	Bushy :5/8 brks	0.3Ctr
1085	Portugal Laurel	Prunus lusitanica	40-60cm	Bushy :4 brks	0.3Ctr

Total :7374

Grass Areas

Weight	Seed Mix Name	Seed Mix Details	Seed Mix Supplier	Density
	Medallion		Rolawn	1/m²

Ground Cover Planting with Bank Stabilisation

Shrubs

Number	Common Name	Species	Height	Pot Size	Specification	Density
403	Japanese Spurge	Pachysandra terminalis		1L	Several shoots :5 brks	6/m²
418	Lesser Periwinkle	Vinca minor		1L	Several shoots :2 brks	6/m²

Total :821

Herbaceous

Number	Common Name	Species	Height	Pot Size	Specification	Density
418		Epimedium rubrum		1-1.5L	Full Pot	6/m²

Total :418

Ferns

Number	Common Name	Species	Pot Size	Specification	Density
156	Hard Fern	Blechnum spicant	1-1.5L	Full Pot	6/m²
156	Common Polypody	Polypodium vulgare	1-1.5L	Full Pot	6/m²

Total :312

Note: Macmat to be cut to accommodate specified 1L planting - cut minimum hole required.

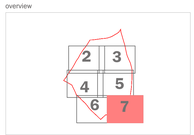
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- Site Boundary
- Existing Vegetation to be Retained — Indicative RPA shown. Refer to the Arboricultural Report for details
- Proposed Trees (Mature Canopy Extent Illustrated)
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- Easement — Refer to engineer's plans for details

For proposed Public Open Space landscape proposals refer to drawing edp5601_d025.

NOTE:
No planting operations to be undertaken within RPAs for trees designated under a TPO. Refer to arboricultural report and plans for details on locations of such trees.

overview



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purpose of issue **PLANNING**

rev	description	date	by
2	Updates following LO comments	12-12-2024	MMm
1	Updates to details following client comment	18-10-2024	MMm
-	Original	14-08-2020	DR

client
Redrow Homes (South Wales) Ltd

project title
Caerleon University Campus

drawing title
Detailed Landscape Proposals for the Residential Plots

Sheet 7 of 8

date	**12 DECEMBER 2024**	drawn by	**LCH**
drawing number	**edp5601_d031z**	checked	**DR**
scale	**1:200 @ A1**	QA	**JTF**

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Appendix EDP 4
Update Habitat Survey, June 2019
(edp5601_d002a 17 July 2019 GY/EM)



Site Boundary

Broadleaved Semi-natural Woodland

SI Poor Semi-improved Grassland

A Amenity Grassland

Dense Continuous Scrub

Ephemeral/Short Perennial

Shrub Planting

Former Allotment

Buildings

Hardstanding

Intact Species-poor Hedgerow

Fence

Wall

Scattered Trees (Broad-leaved)

Scattered Scrub

client

Redrow Homes (South Wales) Ltd

project title

USW Caerleon

drawing title

Plan EDP 1: Update Habitat Survey, June 2019

date	**17 JULY 2019**	drawn by	**GY**
drawing number	**edp5601_d002a**	checked	**EM**
scale	**1:2,000 @ A3**	QA	**JTF**

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CONTENTS

INTRODUCTION, SCOPE AND BACKGROUND 3
PLANNING CONDITIONS 4
SITE DESCRIPTION 6
ARBORICULTURAL IMPLICATIONS ASSESSMENT 7
TREE PRESERVATION ORDER AND CONSERVATION AREA PROTECTION 7
TREES - THE ABOVE AND BELOW GROUND CONSTRAINTS 8
Tree Removal, Retention & Protection Plan. 8
THE PROPOSED DEVELOPMENT FOOTPRINT AND TREE LOSSES 8
Tree Felling and Surgery 43
Tree Protection Fencing 44
REMOVAL OF EXISTING STRUCTURES AND HARD SURFACES 46
INFRASTRUCTURE REQUIREMENTS AND SERVICE SUPPLIES 48
Services. 48
Generic Arboricultural Method Statement – Services. 51
Infrastructure & Retaining Structures 52
WHETHER DESIGN CAN BE MODIFIED TO ACCOMMODATE TREE RETENTION 64
WHETHER TREE LOSSES FROM THE DEVELOPMENT PROPOSAL CAN BE MITIGATED 64
IMPACT ASSESSMENT OF DEVELOPMENT ON TREES. 68
THE EFFECTS THAT DEVELOPMENT PROPOSALS MAY HAVE ON THE AMENITY VALUE OF THE TREES 71
THE END USE OF THE SPACE 71
GENERAL COMMENTS AND OBSERVATIONS 71
GENERAL MATTERS 72
AUDITABLE SYSTEM OF ARBORICULTURAL SITE MONITORING, INCLUDING A SCHEDULE OF SPECIFIC SITE EVENTS REQUIRING INPUT OR SUPERVISION 73
SITE SPECIFIC ABORICUTURAL EVENTS 74
REPORT LIMITATIONS 75
LEGAL CONSTRAINTS 75
REFERENCES 76
APPENDICES 76
FLOW DIAGRAM – PLANNING FOR TREES IN DEVELOPMENT. 77
GROUP 23. NORTH – EAST SECTION – DETAILED TREE CONSTRAINTS PLAN 78
TREE PROTECTION PLAN WITH TREE RETENTION / REMOVAL 79

- 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
- 18137(05)1601A - Tree Report - Sections T5 to T9
- 18137(05)1602A - Tree Report - Sections T10 to 13
- 18137(05)1603 - Tree Report - Sections T12 to T13

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.

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 O).

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.

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 Nothwithstanding 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 Tree Protection Plan and Tree Survey[1] 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 RPA' s 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.
  - U - Dark red dashed line,
  - A - Light green
  - B - Mid blue
  - C - Grey
- The correct positioning for installing suitably robust barrier fencing.
- A suitable and robust barrier fencing detail as recommended in the British Standard[1].
- 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 loses being central to the site often seeing the younger or semi-mature trees planted within the hard landscaping removed. The majority of 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 last and the remainder are U category and deemed unsafe for retention.

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution	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%. *Kretzschmaria deusta* present. *K.. deusta* 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%. *Kretzschmaria deusta* present. *K.. deusta* 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	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 No 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:- T128 (371)	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	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
13	5058	Holly	6	175	Y/EM	**Protected by Tree Preservation Order.** Insignificant small tree/shrub	None	40+	C 2,3	14	2.10
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	Sever ivy and other climbers. Undertake renovation pruning on all fruit trees .	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	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
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
Stump	NA	Goat willow	/	/	M	Recently felled tree with no re-growth form stump as yet.	Treat with glyphosate-based herbicide in accordance with manufacturers instruction, in order 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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
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. *Kretzschmaria deusta* present which is a soft rot decay fungi that leads to a sudden brittle fractures 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
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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						The main fork has enveloped the metal railing stanchion, whilst the forks at 2-m AGL are formed under compression.					
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. Google images in leaf suggests a somewhat thinning upper crown.	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	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
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	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
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 symptoms of Ash dieback disease (*Hymenoscyphus fraxineus*)	40+	C 2,3	7	1.50
G21	NA	Cherry laurel	6	125	EM/ M	Dense group on top of bank that offers some screening. Isolated stems of Japanese knotweed (*Fallopia japonica*) 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	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 (*Chamaecyparis pisifera)*	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	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
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
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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
80	448	Horse chestnut '*Flore Pleno'*	/	/	EM	Bleeding canker of Horse chestnut (*Pseudomonas syringae pv aesculi*) 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 in close proximity to buildings. The magnolia are an unusual species and variety.	G30A - PERSIAN IRONWOOD *(PARROTIA PERSICA)* 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
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 (*Pseudomonas syringae pv aesculi)* and tarry black lesions	Monitor health annually	40+	B 2	102	5.70

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
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 been 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 as a result 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 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	~~Reduce the crown by 3-m distally and remove all deadwood~~ ~~Reduce the south western 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.~~ ~~Monitor crown size versus the structural integrity of stem and buttress roots.~~	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	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						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, fastigiate 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 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	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 in close proximity to 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	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
						Forks under compression at 3-m AGL. Crossing stems at 5-m AGL.					
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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
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
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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
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 Protection Fencing

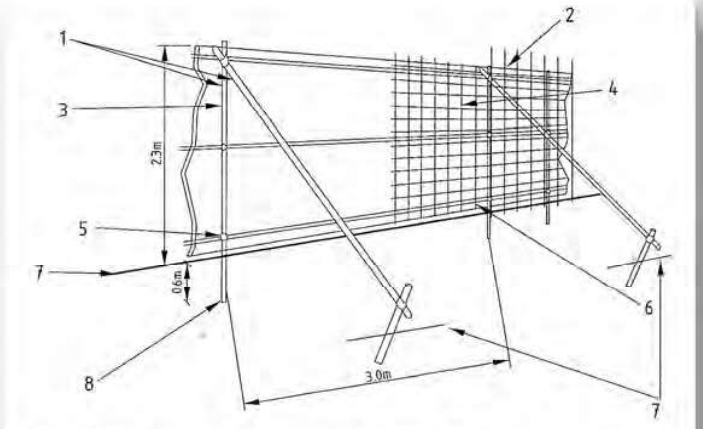
Before any materials or machinery are brought onto site, demolition, stripping of soil or development of any kind commences, all trees to be retained must be protected using robust physical barriers (Refer to Fig 2 & Fig 2 , below) and where necessary, ground protection plates positioned. The correct 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.



1 Standard scaffold poles
2 Uprights to be driven into the ground
3 Panels secured to uprights with wire ties and where necessary standard scaffold clamps
4 Weldmesh wired to the uprights and horizontals
5 Standard clamps
6 Wire twisted and secured on inside face of fencing to avoid easy dismantling
7 Ground level
8 Approx. 0.6 m driven into the ground

Figure 2 — Protective barrier

[3] Approved by the Local Planning Authority



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:-

Recommendations

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

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

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.

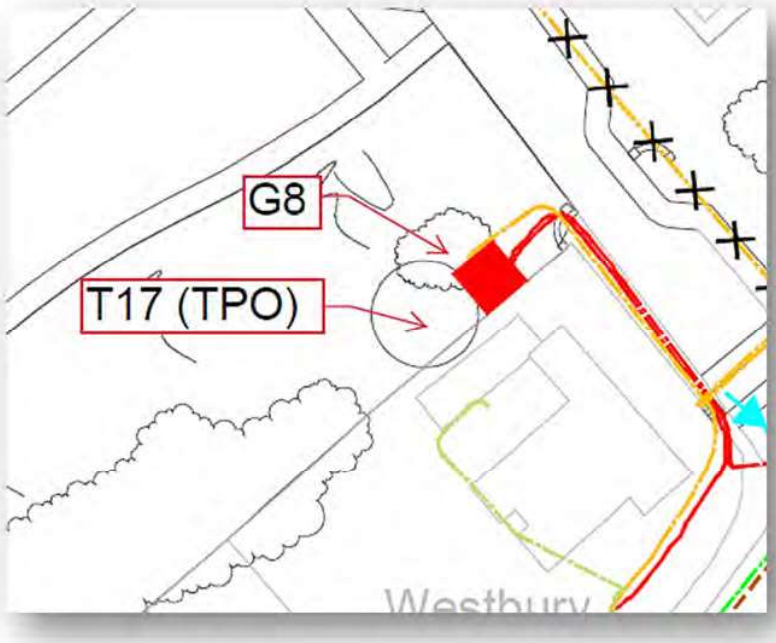
The are no proposed services or diversions that will affect the Root Protection Area of trees . Those services being discontinued will be left in-situ within treed areas, so as to cause no disruption.

NOTE. Plan extracts are taken from an annotated Tree Protection Plan or Proposed Utility-Disconnections & Diversions Plan MU-002 (SMS PLC 2019).

Plan Extract 1. Group 23, northern section (TPO) with existing underground water, electricity & sewer runs.



Plan Extract 4. Group 8 & T107 (TPO) underground electricity cable and sub-station (red line)



Plan Extract 5. Black line indicates approximate route of underground electricity cable with grey line showing overhead cable.

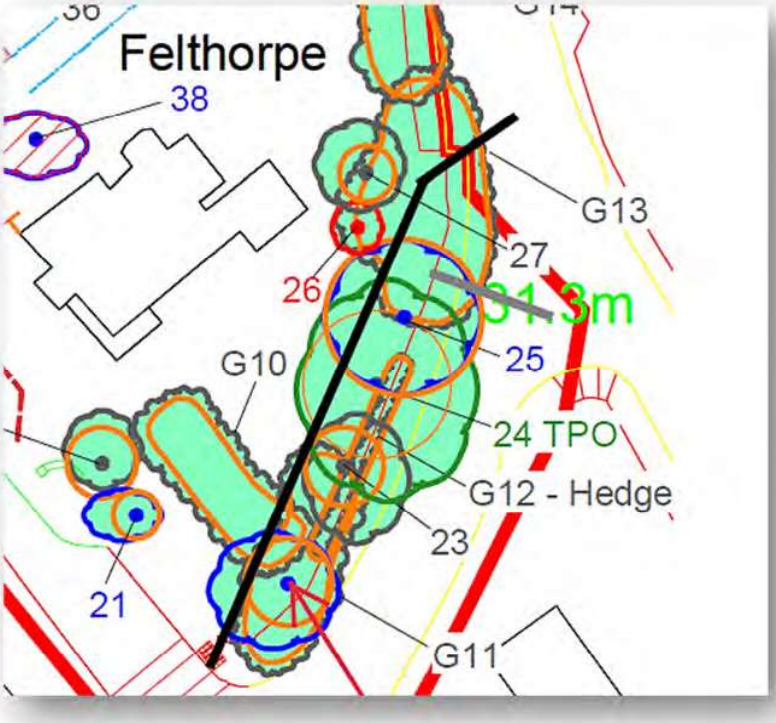


Table 3 Trenchless solutions for differing utility apparatus installation requirements

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.

Infrastructure & Retaining Structures

Level Changes.

There are 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 retained trees and the following is a generic approach should retaining structures be required.**

Generic Arboricultural Method Statement – Retaining Structures

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 particular 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 is 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

GENERIC WORKING METHOD

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 glyphosate[5]. 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 are on occasion close to Root Protection Areas, but do not infringe upon them. On Plan Extract 7f (cross section T6), there is an infringement shown 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 in close proximity to the swales are in maturity and unlikely to significantly increase in size and therefore their rooting area demand should not significantly increase. 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 deigned 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.

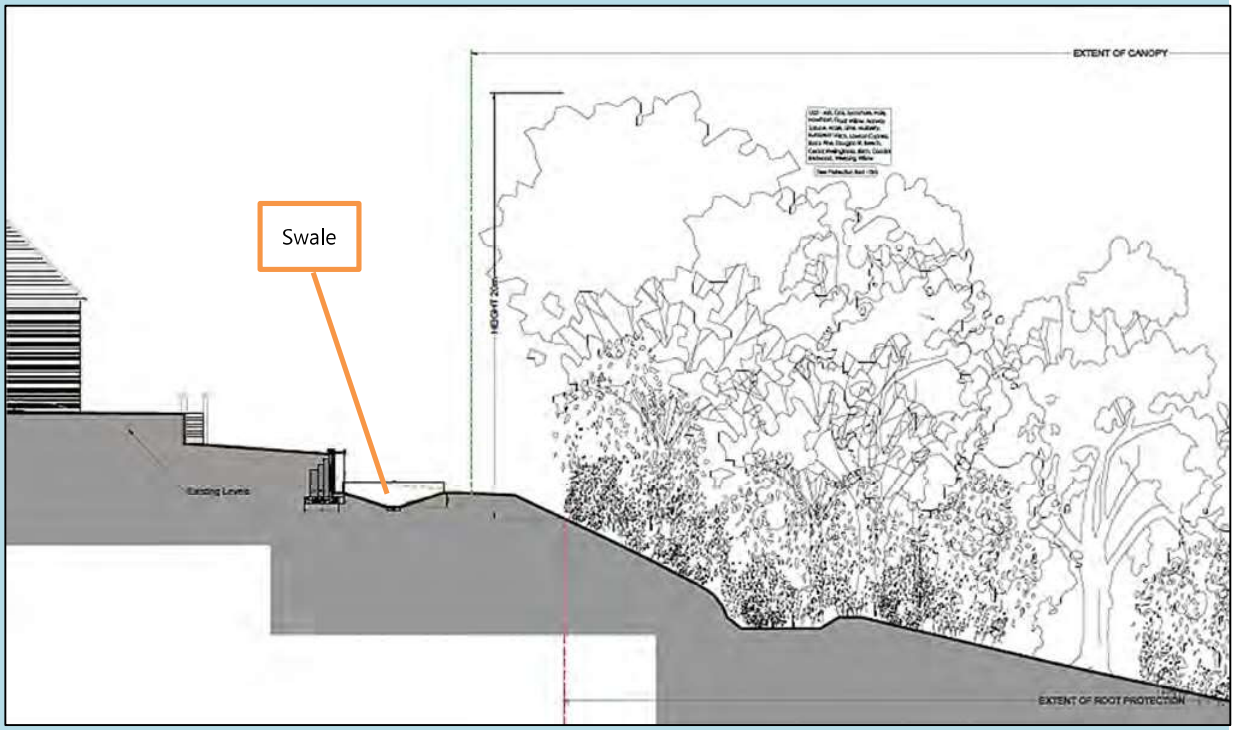
NOTE. The dimensions of the crown spread and Root Protection Area shown within cross-section drawings are taken from the Tree Survey[1], whereas the tree and group graphics are indicative and can on occasion be misleading i.e. Cross section T3 shows the stems of Group 21 extending beyond its own Root 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).

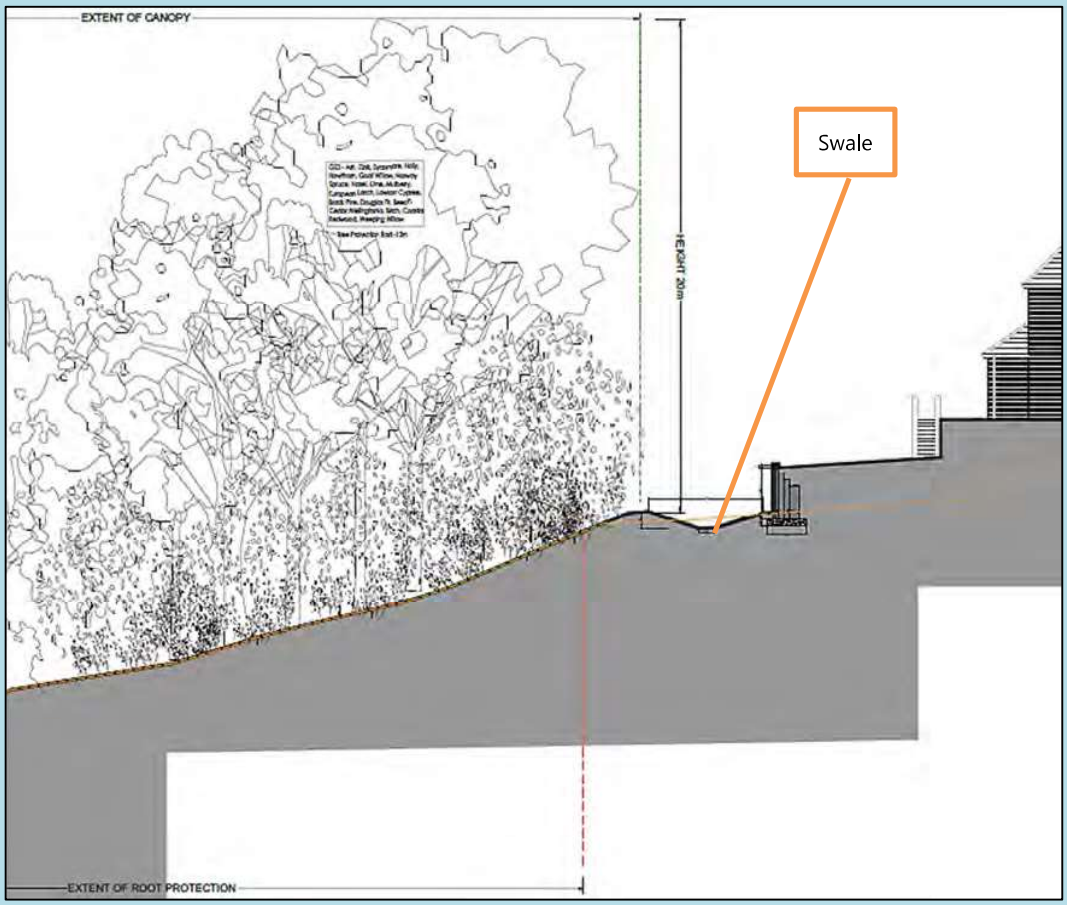
The relevant cross-sectional plans depicting swales near trees, are shown below.

[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.

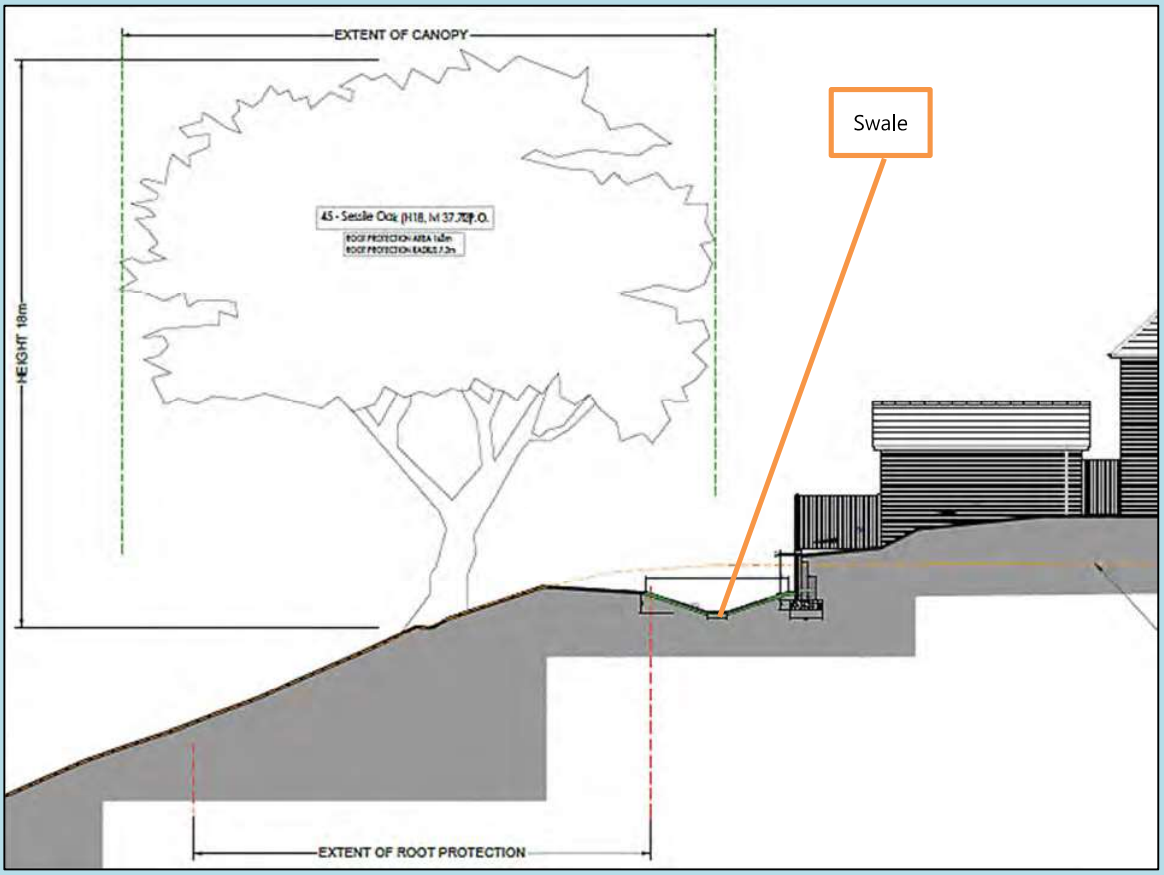
Plan Extract 7a. Section T1 - Swale abutting south-west of G23.



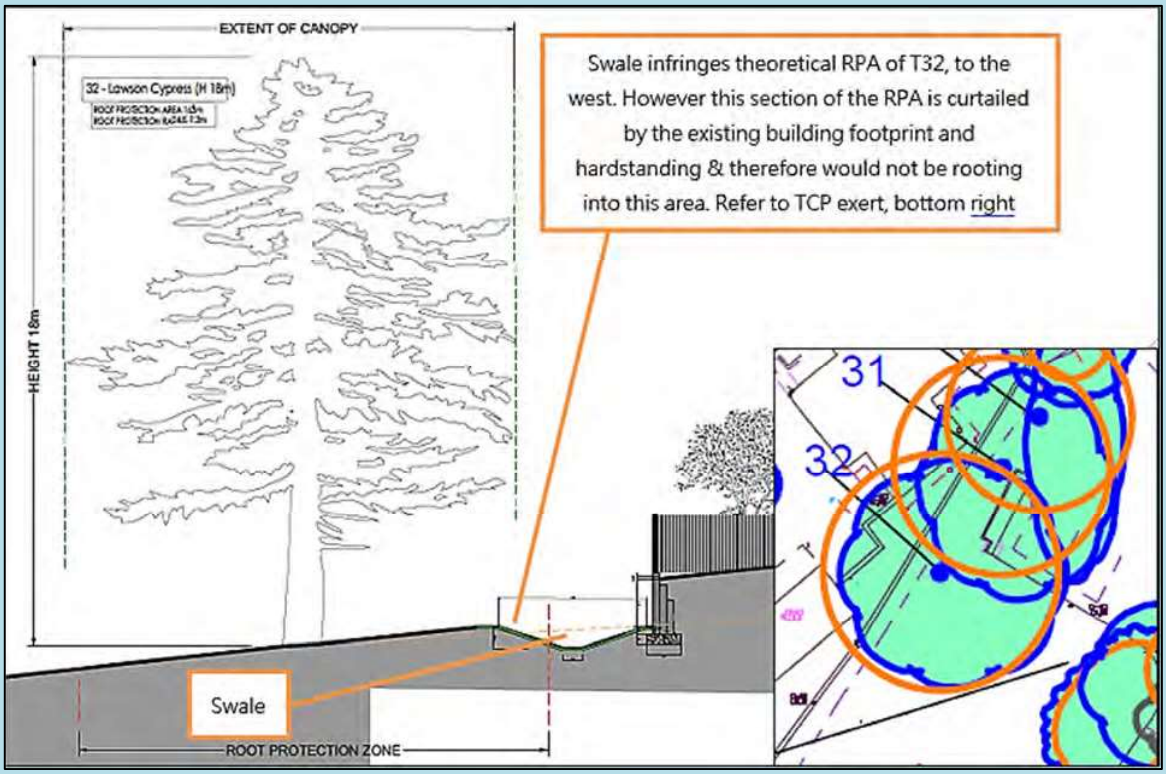
Plan Extract 7b. Section T2 - Section T2 - Swale abutting southern tip to west of G23.



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



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



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

Cycle-path / Public Right of Way

An upgrade in part (from St 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.



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.

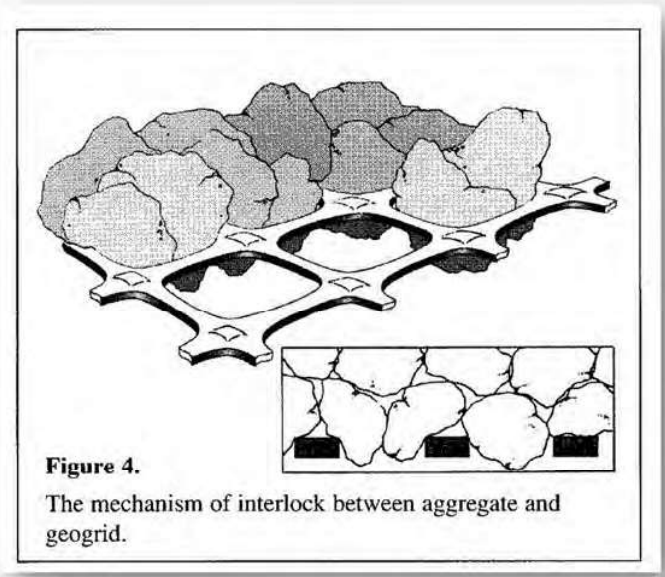


Figure 4.
The mechanism of interlock between aggregate and geogrid.

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.
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 paviours 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.

Vison Splays

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

Signage and CCTV

CCTV and signage is 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 in order to ensue tree losses are minimised and to ensure that all of the A rated trees and a significant proportion of the B category trees are retained.

There, a few specific minor design modification in relation to certain conflicts between trees and the development generally around retaining structures or swales and these are detailed elsewhere within the report.

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 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 5601 A, B, C & D (EDP):

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 grandifloria* and a small glade of young Japanese maple *(Acer palmatum).*

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.
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 with regard 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 in order to supervise the activities when they occur near trees.

Generic Preparatory Works for New Landscaping

Turfing within the Root Protection Area of trees 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 must be followed and us applicable to turfing if that is approved-

1. Ground levels should not be altered.
2. Any existing ground vegetation should be killed using an appropriate herbicide.
3. Dead vegetation may be raked or skimmed off using hand tools and removed from the Root Protection Area.
4. The ground can be only gently scarified to a depth not exceeding 25-mm. The use of rotavators must be avoided.
5. Ground scarification may only take place within the RPA of retained trees under the supervision of the Project Arborist.
6. Seed (or turf) may be laid directly onto this.
7. Care must be taken to avoid compaction so ideally done during dryish conditions avoiding working on wet and saturated soils.
8. The use of fertilisers must be avoided.
9. Ground 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 as agreed with the Project Arborist.
10. Any works within the RPA must be supervised by the Project Arborist.

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

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.

The majority 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 in close proximity to 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 form 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 as a result 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.

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 as 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 taken into account**. 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.

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.

GENERAL MATTERS

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

- Alteration of ground levels, including soil stripping.
- 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 aforementioned British Standard.
- Excavation of any kind.
- Storage of any materials or equipment, even on a temporary basis.
- 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.
- Fires must not be lit beneath or within 12-m of any tree canopies.
- 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.
- 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 maintained at all times. 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).

Drainage

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

NOTE. It is both good practice and, in many cases, a regulatory requirement to maintain existing groundwater conditions within, and reduce run-off from, a development site. This can be achieved, for example, using permeable hard surfaces and techniques associated with sustainable urban drainage systems (SUDS). Such techniques can be designed and implemented to benefit both existing and new trees. (SUDS water might need to be treated/filtered and/or tree rooting areas protected from direct contamination in risk areas.)

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SITE SPECIFIC ABORICUTURAL EVENTS

→ 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.

→ 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.

→ Demolition works near trees (also covered in part within a previous [12]report)

→ Early consultation required with the Project Arborist in order 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 form Root Protection Areas. Project Arborist to undertake site supervision in certain locations if pinch points occur.

→ Installation of Tree Protection Fencing.

→ Landscaping activities within Root Protection Area.

→ Consultation required with Project Arborist should the route of service runs change and they occur near or within the Root Protection Area of trees.

[12] Caerleon University Campus AMS_TPP Phase 1 demolition July 2020

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

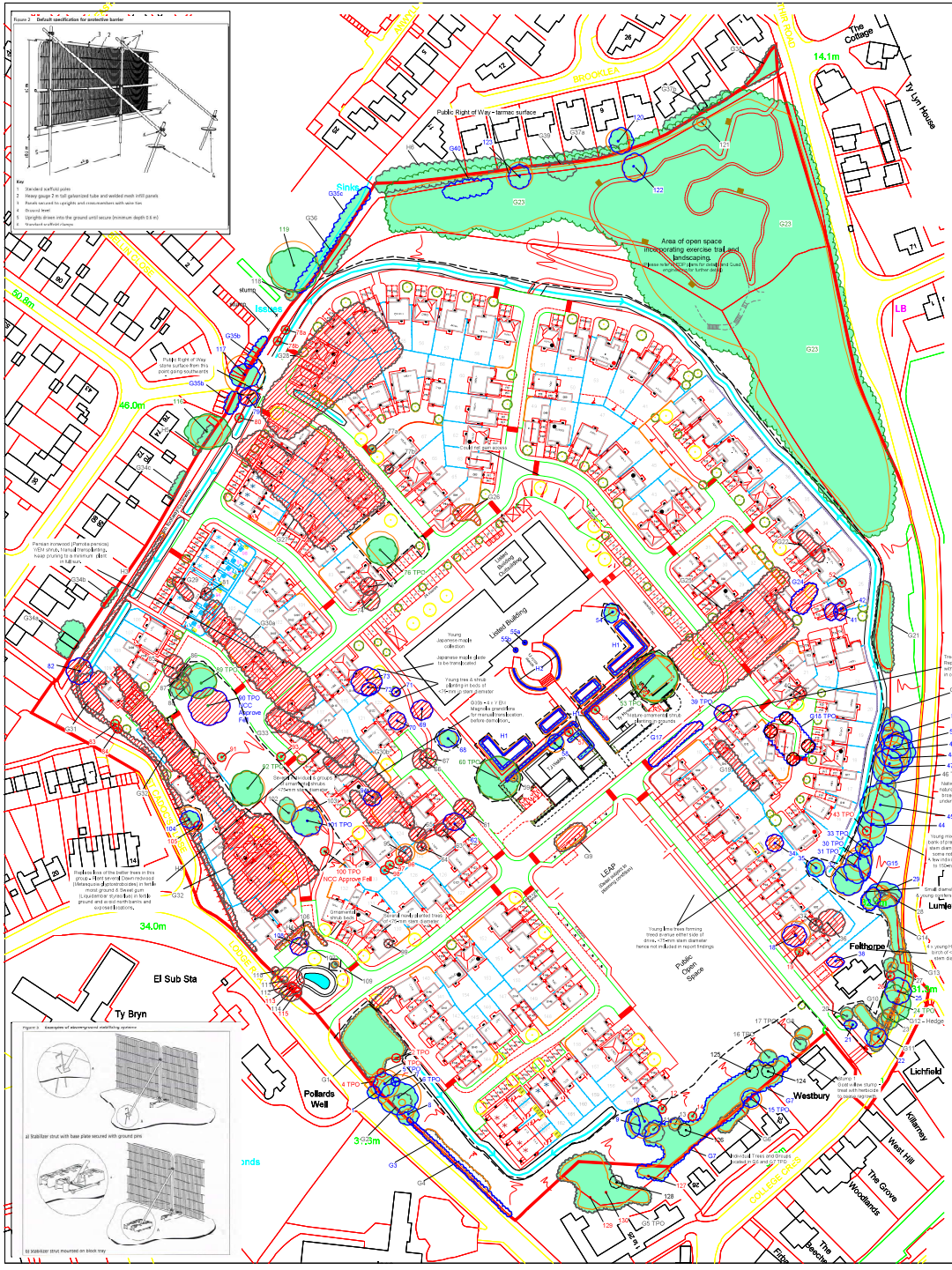
FLOW DIAGRAM – PLANNING FOR TREES IN DEVELOPMENT.

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

TREE PROTECTION PLAN WITH TREE RETENTION / REMOVAL

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





Tree Number	Tree Tag	Height	Effectual Diameter	Life Stage	Remaining Contribution (years)	Retention Category	Protection Area m2	Protection Radius (m)
1	NA	19	500	M	40+	B 2	113	6
G1	NA	5	150	M	20-40	C 2	10	1.8
2	5042	20	725	M	<10	U	U	U
3	5043	21	675	M	<10	U	U	U
4	5044	19	525	M	<10	U	0	0
5	5045	19	550	M	Oct-20	B 1	137	6.6
6	463	16	850	M	40+	B 2,3	327	10.2
7	462	12	175	Y/EM	40+	B 2	14	2.1
8	464	10	200	EM/M	20-40	C 1	18	2.4
G2	NA	7	125	EM	40+	C 2,3	7	1.5
G3	NA	2	75	EM	20-40	D 2	3	0.9
G4	5046, 5051	9	175	Y/EM	20-40	C 2	14	2.1
G5	NA	10	175	EM	Oct-20	C 2	14	2.1
9	466	18	350	M	20-40	B 2,3	55	4.2
10	467	18	650	M	20-40	B 2,3	191	7.8
11	5056	7	175	EM/M	Oct-20	C 2	14	2.1
12	5057	11	125	M	Oct 20	U	0	0
13	5055	6	175	Y/EM	40+	C 2,3	14	2.1
G6	NA	10	125	Y/EM	20-40	C 2	7	1.5
14	5059	5	100	EM	<10	U	5	1.2
15	NA	15	400	Y/EM	20-40	B 2	72	4.8
G7	NA	10	300	M	Oct-20	B 2,3	41	3.6
16	5060	6	300	EM/M	<10	C 2	41	3.6
17	1361	11	350	EM	40+	C 2	55	4.2
G8	NA	10	125	EM	20-40	C 2,3	7	1.5
Stump	NA	/	/	M	Oct-20	U	0	0
G9	NA	6	100	EM/M	Oct-20	C 2	5	1.2
18	468	10	550	EM	40+	B 2	137	6.6
19	1302	/	/	EM/M	<10	U	0	0
20	1383	16	225	EM	20-40	C 2,3	23	2.7
21	1385	13	150	Y/EM	40+	B 1,3	10	1.8
G10	NA	10	300	EM/M	Oct-20	C 2	41	3.6
22	1386	12	275	EM/M	40+	B 2,3	34	3.3
G11	NA	12	150	Y/EM	Oct-20	C 2	10	1.8
G12	NA	2	75	Y	40+	C 2,3	3	0.9
23	1387	7	250	EM/M	Oct-20	C 2,3	28	3
24	471	15	475	Y/EM	40+	A 2,3	102	5.7
25	472	17	500	M	20-40	B 1,2	113	6
G13	NA	11	150	Y/EM	20-40	C 2,3	10	1.8
26	1389				/	U	0	0
27	1390	10	175	EM	20-40	C 2,3	14	2.1
G14	NA	14	300	EM/M	20-40	C 2	41	3.6
28	1392	16	225	EM/M	40+	C 2	23	2.7
29	1391	10	275	EM/M	40+	D 2	34	3.3
G15	475	18	525	M	20-40	B 2	125	6.3
30	473	20	475	M	40+	B 2,3	102	5.7
31	474	20	550	M	40+	B 2	137	6.6
32	476	18	600	M	20-40	B 2	163	7.2
33	1393	19	475	EM/M	40+	B 2,3	102	5.7
G16	NA	7	75	Y/EM	40+	C 2	3	0.9
34	1394	8	200	Y/EM	40+	B 2	18	2.4
35	1305	8	200	Y/EM	40+	B 3	18	2.4
36	1396	10	325	EM	20-40	C 3	40	3.9
37	1397	8	125	EM	40+	C 2,3	7	1.5
38	1398	14	200	EM	40+	B 1,3	18	2.4
G17	NA	10	250	Y/EM	40+	D 2	20	3
39	1399	14	275	EM	40+	B 1,2	34	3.3
G18	1400, 1229, 1.22, 82, 2223	10	200	Y/EM	20-40	D 2	18	2.4
G19	NA	5	100	Y	40+	C 2	5	1.2
40	2204	5	125	Y/EM	20-40	C 2	7	1.5
41	2288	13	175	Y/EM	40+	B 2	14	2.1
42	2287	14	250	Y/EM	40+	B 2	28	3
43	2208	17	400	EM	~10	U	72	4.8
44	2290	18	500	EM	40+	B 2,3	113	6
45	2291	18	600	M	40+	B 2,3	163	7.2
46	2292	10	250	EM	20-40	C 3	20	3
47	2293	18	550	EM	40+	B 2,3	137	6.6
48	2294	19	600	EM/M	40+	B 2,3	163	7.2
49	2295	10	600	EM/M	40+	B 2,3	103	7.2
50	2296	18	525	EM/M	40+	B 2,3	125	6.3
51	2207	18	350	EM	20-40	B 2,3	55	4.2
G20	NA	15	125	Y/EM	40+	C 2,3	7	1.5
G21	NA	6	125	EM/M	20-40	C 2	7	1.5
52	2298	6	/	EM	<10	U	0	0
G22	NA	10	150	EM	Oct-20	C 2	10	1.8
G23	NA	20	1000	M	40+	A 1,2,3	452	12
G24	NA	11	225	EM	20-40	B 2	23	2.7
G25	NA	4	150	Y	20-40	C 2	10	1.8
53	2299	19	700	M	40+	A 1,2	222	8.4
H1	NA	2	100	EM	40+	B 1	5	1.2
54	2300	10	150	Y/EM	40+	B 2	10	1.8
H2	NA	1	75	EM	40+	H 1	3	0.9
55a, 55b	NA	2	100	EM	40+	B 1	5	1.2
56	1641	7	/	EM/M	<10	U	0	0
57	1642	7	/	EM/M	<10	U	0	0
58	1643	9	350	EM/M	Oct 20	D 2	55	4.2

(Please check all RPA's on site.)

Tree Number	Tree Tag	Height	Effectual Diameter	Life Stage	Remaining Contribution (years)	Retention Category	Protection Area m2	Protection Radius (m)
59		5	100	Y/EM	20-40	C 2	5	1.2
60	429	20	800	M	40+	A 2	290	9.6
61	430	14	325	EM/M	20-40	C 2,3	48	3.9
62	1644	15	425	EM/M	20-40	B 2,3	82	5.1
63	432	12	225	EM	20-40	C 2,3	23	2.7
64	434	6	275	EM	20-40	C 2	34	3.3
65	1645	4	250	EM	20-40	C 2	28	3
66	428	10	400	EM	<10	C 2	72	4.8
67	1646	3	325	EM	Oct-20	C 2	48	3.9
68	426	11	325	EM	40+	B 1,2	48	3.9
69	1647	10	250	Y	40+	B 2,3	28	3
70	1648	10	175	Y	40+	B 2,3	14	2.1
71	1649	8	150	Y	40+	B 2,3	10	1.8
72	425	18	325	EM/M	20-40	B 2,3	48	3.9
73	1650	16	525	M	20-40	B 2	125	6.3
74	422	8	350	Y/EM	20-40	C 2	55	4.2
75	421	7	350	Y/EM	20-40	C 2	55	4.2
76	1651	20	700	M	40+	A 2	222	8.4
G26	NA	6	100	Y	40+	C 2	5	1.2
G27	NA	4	75	Y	20-40	C 2	3	0.9
77a, 77b	NA	4	125	Y	20-40	C 2	7	1.5
G28	NA	5	150	Y	20-40	C 2	10	1.8
78a	451	/	/	/	Oct-20	U	0	0
78b	450	/	/	/	Oct-20	U	0	0
79	449	10	325	EM/M	40+	B 2	48	3.9
80	448	/	/	EM	<10	U	0	0
G29	NA	8	225	Y/EM	20-40	C 2	23	2.7
81	1652	8	150	Y	40+	C 2	10	1.8
G30a,b	NA	6	150	Y	20-40	C 2	10	1.8
H3	NA	3	100	EM	20-40	C 2	5	1.2
82	418		475	EM	40+	B 2	102	5.7
G31	1653, 1654	10	150	Y	40+	C 2	10	1.8
83	416			Y	<10	U	0	0
84	415			M	Oct-20	U	0	0
G32	NA	5	125	Y	20-40	C 1	7	1.5
85	411	10	350	M	Oct-20	C 2,3	55	4.2
86	414	6	200	EM	Oct-20	C 2,3	18	2.4
87	412	10	250	EM/M	Oct-20	C 1,3	28	3
88	413	10	325	EM/M	Oct-20	C 2,0	40	3.9
89	1658	15	575	M	40+	A 1,2	260	9.9
90	409	16	1025	M	20-40	B 1, 2	0	0
91	405	11	550	M	<10	U	137	6.6
92	404	16	625	M	40+	A 1,2	177	7.5
93	479	/	/	EM	<10	U	0	0
G33	NA	14	250	Y/EM	40+	B 2	28	3
94	4541	18	625	M	40+	B 2	177	7.5
95	436	17	350	EM/M	<10	C 2,3	55	4.2
96	4542	14	350	EM/M	<10	U	55	4.2
97	438			EM	<10	U	0	0
98	439			EM/M	<10	U	0	0
99	4543	11	150	Y	40+	C 2	10	1.8
100	4544	16	850	M	20-40	U	327	10.2
101	4545	18	600	EM/M	40+	B 2	163	7.2
102	403	5	350	EM/M	Oct-20	C 1	55	4.2
103	402	6	275	EM	Oct-20	U	34	3.3
104	407	18	475	EM/M	40+	B 2	102	5.7
105	406			EM/M	<10	U	0	0
H4	NA	3	75	Y/EM	20-40	C 2	3	0.9
106	NA	6	100	Y	40+	C 2,3	5	1.2
107	NA	10	200	EM	40+	C 2	18	2.4
108	4546	15	300	EM	40+	B 2	41	3.6
109	NA	6	125	Y	40+	C 2,3	7	1.5
110	447	9	200	EM	20-40	C 2	18	2.4
111	NA	8	200	Y/EM	40+	C 2	18	2.4
112	4548	16	400	EM/M	20-40	C 2,3	72	4.8
113	4547			EM	40+	U	0	0
114	4549	15	325	EM	40+	C 2	48	3.9
115	4550	17	450	M	Oct 20	U	0	0
G34 a	NA	10	150	EM/M	20-40	C 2,3	10	1.8
G34 b,c	NA	11	275	EM/M	20-40	C 2,3	34	3.3
H5	NA	3	200	Y/EM	40+	C 2	18	2.4
116	NA	16	600	M	40+	A 2,3	163	7.2
G35a,b,c	NA	10	250	EM/M	40+	B 2,3	28	3
117	NA	16	750	M	40+	B 2,3	254	9
118	NA	11	150	Y	40+	C 2,3	10	1.8
119	NA	19	950	M	40+	A 2,3	408	11.4
G36	NA	13	300	EM	40+	C 2,3	41	3.6
H6	NA	11	200	Y	40+	C 2	18	2.4
G37a,b	NA	10	150	Y/EM	40+	C 2	10	1.8
120	NA	12	450	EM	40+	B 2,3	92	5.4
G38	NA	10	200	Y/EM	40+	C 2,3	18	2.4
121	NA	10	175	Y/EM	40+	C 2	14	2.1
122	NA	14	450	EM/M	40+	B 2,3	92	5.4
G39	NA	10	150	Y/EM	Oct-20	C 2,3	10	1.8
123	NA	16	500	EM/M	40+	B 2	113	6
G40	NA	20	450	EM/M	20-40	B 2,3	92	5.4

(Please check all RPA's on site.)

Key

Trees to be considered for retention.

- A - High
- B - Moderate
- C - Low

Trees unsuitable for retention.

- U - Fell
- Root Protection Area
- Tree lost to development
- Barrier Fencing

Individual trees – Fig 2.
Groups - Alternate Type. Fig 3.

Tree Key

Crown Spread. Measured in North, South, East and West side of tree.

Tree number. (T - Individual Tree, G - Group, A - Tree area, W - Woodland, H - Hedgerow)

Root Protection Area (RPA)
A layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.

The original of this drawing was produced in colour. A monochrome copy should not be relied upon.

This plan should be read in conjunction with Ambler SJ. Tree Survey, Categorisation and Constraints Report at Former University Campus, Caerleon
Dated February 2019

Steve Ambler & Sons Tree Specialists Ltd
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Client	Redrow
Surveyed by	SJA
Date surveyed	September 2020
Drawn by	LP
Scale	1:1000 when printed at A1
OS Grid Ref	333510 (E) 191290 (N)

INDICITIVE ONLY.
PLEASE REFER TO ROOT PROTECTION TABLE.
DO NOT SCALE FROM THIS DRAWING
CHECK ALL DIMENSIONS ON SITE

REF. DRAWINGS

18137(05)1101N	Proposed Site Plan

TITLE

Tree Protection Plan with Tree Retention / Removal for AIA & AMS
Former University Campus, Caerleon

DRAWING No:

SAAC.19.012d

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CONTENTS

1. INTRODUCTION 3
2. SITE DESCRIPTION AND OBSERVATIONS 4
3. SPECIES RECORDED 7
4. TREE SURVEY & TREE SURVEY PLAN 8
5. TREE CONSTRAINTS PLAN 9
6. RECOMMENDATIONS 10
7. SCHEDULE OF FINDINGS 13
8. LEGAL CONSTRAINTS 59
9. LIMITATIONS OF THIS REPORT 60
10. TERMS AND DEFINITIONS 61
11. GLOSSARY OF TERMS 62
12. REFERENCES 63
13. APPENDICES 63
APPENDIX A - TABLE 1 TREE QUALITY ASSESSMENT 64
APPENDIX B - DEFAULT SPECIFICATION FOR PROTECTIVE BARRIER 66
APPENDIX C - TABLE B1- TREES AND THE PLANNING SYSTEM 67
APPENDIX D - PHOTOGRAPHS 68
RESISTOGRAPH READINGS 86
APPENDIX E – TREE CONSTRAINTS PLAN 91

c) Woodland Management, National Diploma - Distinction (Hereford College of Agriculture)
d) Rural Studies, Btec First Diploma – Distinction (Pencoed College)
e) Lantra Award, "Bats and Arboriculture – A Guide for Practitioners" developed by The Bat Conservation Trust.
f) Professional Tree Condition Certificate (Lantra Awards)

This survey report is overseen and assessed by Steve Ambler who is a professional arboriculturalist with over 38 years' experience in the arboricultural industry. His Consultancy Practice was established during 1999 and expanded in 2006 with the launch of a specialist tree management unit to become - Steve Ambler & Sons Tree Specialists. Steve holds the following relevant arboricultural 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.

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

Unless otherwise stated, this report remains valid for 12 months. Trees require frequent inspections and the next one is recommended within 12 months of the date of this Report.

2. SITE DESCRIPTION AND OBSERVATIONS

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 adjoining housing to the north – north-east.

Post Code: NP18 3NU
OS 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.

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 "Aspleniifolia)* and a Common walnut (*Juglans regia*).

TPO 5 of 2016 was made on the 18th 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.*

retention in a high target occupancy setting or indeed their current setting (Trees 2, 3 & 4). The remaining limes in this location should be monitored for signs of this pathogen, including the adjoining street tree in NCC ownership.

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

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

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 PRoW and within the woodland / parkland grouping of G23, thereby improving habitat connectivity. Planting could be in the form of mixed native woodland, specimen tree planting and the creation of native hedgerows. Group 23 would also benefit from a wider management plan to consider tree condition, access facilities, interpretation and woodland management.

There may be scope to consider the use of a tree spade to re-locate some trees that pose significant constraints and are deemed to be of high value, but this needs careful consideration in terms of practicality (access, service runs), existing built structures), survival rates and a cost comparison with planting large size stock replacements, as an alternative. This would include but not exclusively the evergreen Magnolia' s grown as standards within G30 b, the relatively young collection of Japanese maple varieties (*Acer palmatum var*) to the south-west of the main house and the Tulip tree (T39).

This updated version of the Tree Survey now includes the additional surveyed areas along the Public Right of Way bordering the site to the north and north-west. Trees on adjoining land to this path has also been included where trees occur within influencing distance.

A detailed tree conditions inspection has also been undertaken in April on the orchard (G7), T90 & T100 - Foxglove tree (*Paulownia tomentosa*), T92 Common walnut (Juglans regia) and T6 – Sessile oak (Quercus petraea). Decay detection equipment (Resistograph 500 unit [2]) was used as was a climbing inspection for the walnut.

[2] Resistograph 500 Drill: this instrument is based on measuring the drilling resistance along a small needle path when inserted into the tree with a constant drive. The drilling resistance at the needle tip is transferred by use of different gearboxes to a pointer that is visible at the top of the instrument. The pointer scratches the drilling profile on a waterproof wax paper printout using a 1: 1 scale, recording the resistance offered to the torque of the drill bit and thus assess to some extent the quality of the wood. As the drilling resistance of the tree is a function of the mechanical wood quality, defect zones and

Red oak (*Quercus rubra)*
Rowan (*Sorbus aucuparia*)
Sessile oak (Quercus petraea)
Silver birch (*Betula pendula*)
Silver birch 'Obelisk' *(Betula pendula 'Obelisk'*)
Silver maple (*Acer saccharinum*)
Small-leaved lime (*Tilia cordata)*
Smoke tree (*Cotinus coggygria)*
Southern evergreen magnolia (*Magnolia grandiflora* var)
Stone pine (*Pinus pinea*)
Swamp cypress (*Taxodium distichum*)
Sweet bay (*Laurus nobilis*)
Sweet chestnut (*Castanea sativa*) ,
Sycamore (*Acer pseudoplatanus*)
Tulip tree (*Liriodendron tulipifera*)
Wellingtonia (*Sequoiadendron giganteum*) Coastal redwood (*Sequoia sempervirens*)
Western catalpa (*Catalpa speciosa*)
White willow (*Salix alba*)
Willow-leaved pear (*Pyrus salicifolia*)
Wilson' s honeysuckle (*Lonicera nitida*)
Yew (*Taxus baccata*)
Young' s weeping birch (*Betula pendula 'Youngii'*)

4. TREE SURVEY & TREE SURVEY PLAN

This tree survey will include each tree within the site boundary with a stem diameter of above 75-mm or in the case of woodland trees or large groups those measuring above 150-mm when measured at a height of 1.5-m above ground level. Trees over this size growing on land adjacent to the site, which are within a distance equal to 12 times their stem diameter from the boundary, are also included.

Each tree or group of trees is identified on the attached plan. Large trees are sometimes identified on site using a numbered tag attached to the trunk of each tree at 1.5-2.0 metres above ground level. A tabular format later in the report (8. Schedule of Findings) records baseline details of each tree or group against the appointed tree number or numbered tag.

The report assigns the trees to one of four categories U, A, B, C (see Appendix A - Table One) depending on their overall health, size, condition, amenity, cultural and conservation value, their suitability in view of the increased usage that will arise following development. For trees in categories A to C, it should qualify under one or more of the three subcategories (1, 2, 3). Subcategories 1, 2, and 3 are intended to reflect arboricultural and landscape qualities, and cultural values, respectively. This system will also identify any unsuitable trees and suggest removal where necessary.

Where trees are found to require immediate attention, they will be identified in red bold text in the schedule of findings

Particular care is needed when considering the quality and value of C grade and young trees, especially where they occur as individual specimens and should not dominate site layout considerations.

The reference numbers of the surveyed trees are included in the survey schedule and shown on the Tree Constraints Plan (TCP) which should be read in accordance with this report.

Trunk diameters are measured at 1.5 metres above ground level and rounded to the nearest 25 millimetres.

6. RECOMMENDATIONS

Your attention is drawn to the condition of tree numbers 2, 3, 4, Tag 5053, 12, 14, 19, 26, 43, 52, 56, 58, 78a 78b, 80, 83, 84, 91, 93, 96, 97, 98, 105, 113 & 115. These trees are considered to be either in a dangerous condition or causing damage to existing structures and it is recommended that they are felled immediately.

Efforts should be made to retain category A and B trees

C category trees may be retained if desired although not need necessarily be a significant constraint on the site' s potential.

Category U trees should be removed as part of any site development and evaluated through a site risk assessment in the sites existing current situation.

Design and layout should take account of existing trees of importance and consider their requirements to maintain existing landscape value where possible. The site layout should ensure construction activity is outside the RPA of any retained trees. Recommended minimum RPA radii are shown in the final column of the survey schedule and diagrammatically as circles on the TCP.

In view of the recommendations for the design and construction process, in considering tree care (Figure 1, Appendix A), further assessments are required throughout the planning and design phase and recommended as follows...

(1) **Arboricultural Implications Assessment** (AIA)
(2) **Tree Protection Plan** (TPP),
(3) **Arboricultural Method Statement** (AMS) which should be undertaken by an 'Arboriculturalist' .

Tree clearance works or works other than those to deal with serious defects posing considerable risk shall not commence until such time written approval or full planning approval is received from the Local Planning Authority. Any authorised tree works should be completed prior to the onset of any demolition or construction works, taking account of all legal constraints.

Trees require regular inspections, once the development is complete all the retained trees should be re-examined by an arboricultural specialist.

Where the installation of paths or lightweight structures such as walls are unavoidable near to trees, the design and construction specification needs to take account of future growth. Refer to Table A of the Standard.

Shading of buildings by trees can be a problem, particularly where there are rooms which require natural light. Buildings will need to be positioned further away than just the outer edge of tree canopies in order to reduce the likelihood of pressure from future occupiers for tree removal or trimming. This applies particularly where windows of habitable rooms will face onto tree canopies. Future dimensions of immature trees and shadow

- 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 to prevent running contamination. Phytotoxic materials would include any mineral oil, fuels, cement mortar washings concrete washings, mortar.
- Fires must not be lit beneath or within 12-m of any tree canopies.
- 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.
- Mechanical cultivation of the soil as part of landscaping operations.

Tree felling and surgery may be required to allow access for construction or future site traffic, or in the interests of the future health and safety. Detailed recommendations for such works can be provided once a final site layout is agreed and it is determined which trees (if any) are to be retained. All surgery should comply with the British Standards 3998:2010 Tree Work Recommendations or more recently accepted arboricultural good practice. The legal position regarding site designations should be considered.

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
3	5043	Common lime	21	575	4	4	5	2	3	2	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%. *Kretzschmaria deusta* present. *K.. deusta* 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	5	2	5	5	4	3	M	**Protected by Tree Preservation Order.** Tree of reasonable form but with crown dieback by some 5%. *Kretzschmaria deusta* present. *K.. deusta* is a soft rot decay fungi that leads to brittle fractures of the base and roots. Refer to Photograph 2, in Appendices	Fell to ground level, with replacement planting. Species and location to be agreed with Local Planning Authority	<10	U	0	0.00
5	5045	Common lime	19	550	5	6	5	5	2	3	M	**Protected by Tree Preservation Order.** Tree of good form near frontage.	Remove basal epicormics and inspect base and lower stem.	10-20	B 1	137	6.60

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
The crown is formed of lateral scaffold limbs that are often 'dog legged' with acute change of angles. **Resistograph Results Summary (Refer to test readings in Appendices)** North = Pass South buttress = decay at 14-cm East buttress= decay at 12-cm West = Decay in sapwood between 5-6-cm **Recommendations** 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 (A*rmillaria mellea*) 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. 1. Access facilitation pruning may be required. 2. 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.																
7	462	Common lime	12	175	2	2	2	2	2	1	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	4	5	5	5	1	2	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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
Tree Condition Inspection.																	
Tree No	**Tree Tag**	**Species**	**Remarks**										**Recommendations**				
128	371	Elder	Multi-stemmed specimen with crown dieback by 30%.										Coppice to 30cm from ground level and finish with a clean cut at 20 degrees.				
129	5055	Apple	Root-plate failure with tree resting on boundary fence and overhanging Isca Court. Refer to Photograph 21d, in Appendices										Dismantle and make safe lying flat on the woodland floor.				
130	5053	Apple	*Ganoderma applanatum* fungal bracket noted which causes a white rot with associated basal decay and a fractured and failed main stem.										Fell to ground level.				
9	466	Silver birch	18	350	6	6	0	7	4	3	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	8	7	8	7	2	2	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	3	6	5	5	0	2	EM/ M	Insignificant small tree/shrub	None	10-20	C 2	14	2.10
12	5057	Goat willow	11	125	6	6	7	6	0	1	M	**Protected by Tree Preservation Order.** Mature stool with early mature growth. Multi-stemmed specimen from base.	Fell to ground level	10-20	U	0	0.00

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G7	NA	Orchard consisting of mixed fruit trees	10	300	5	5	5	5	2	2	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. Refer to Photograph 3, in Appendices	Sever ivy and other climbers. Undertake renovation pruning on all fruit trees Implement recommendations below.	10-20	B 2,3	41	3.60

Tree Condition Inspection.

Tree No	Tree Tag	Species	Remarks	Recommendation
124	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. Refer to Photograph 21a, in Appendices	Target prune crossing, damaged branches
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. Refer to photograph 21b, in Appendices	Remove fractured limb. Monitor linear cavity on east stem every 18 months.

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G9	NA	Cherry laurel	6	100	3	3	3	3	0	0	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	5	5	5	6	4	2	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	4	2	3	3	5	4	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	2	2	2	4	5	4	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	5	5	5	5	0	0	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	4	5	4	6	4	2	EM/M	Tree of reasonable form, with a bifurcated stem at 1-m AGL.	None	40+	B 2,3	34	3.30

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
25	472	Lawson cypress	17	500	6	6	6	6	1	0	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	4	4	4	4	2	2	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. *Kretzschmaria deusta* present which is a soft rot decay fungi that leads to a sudden brittle fractures of the base and roots.	Fell to ground level	/	U	0	0.00
27	1390	Holly	10	175	4	3	3	4	2	2	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)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
												Twin stemmed specimen subordinate to tree 31. Tree of fair form with a dominant east stem					
31	474	Common lime	20	550	6	8	7	5	2	5	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. Decay developing in the three large diameter pruning wounds. Refer to Photograph 5, in Appendices	Monitor structural issues annually, if retained	40+	B 2	137	6.60
32	476	Lawson cypress	18	600	7	7	8	6	3	1	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 systems	20-40	B 2	163	7.20

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	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	4	3	4	4	2	2	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	4	4	4	4	3	2	EM	**Protected by Tree Preservation Order.** Tree of good form in planting grill in paved seating area, adjoining the car park. Refer to Photograph 6, in Appendices	Investigate rooting pit and improve rooting space if required and retained. Otherwise consider transplanting with tree spade following careful removal of surrounding,. hardstanding.	40+	B 1,2	34	3.30
G18	1400, 2281, 2282, 2283	Himalayan birch	10	200	4	5	4	5	2	1	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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
44	2290	Sessile oak	18	500	7	10	7	6	4	3	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	10	10	10	9	2	2	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	5	6	4	5	2	2	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	9	7	6	8	4	4	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)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
51	2297	Ash	18	350	7	6	7	3	6	2	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	6	6	5	4	3	2	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 symptoms of Ash dieback disease (*Hymenoscyphus fraxineus*)	40+	C 2,3	7	1.50
G21	NA	Cherry laurel	6	125	3	3	3	3	0	0	EM/ M	Dense group on top of bank that offers some screening. Isolated stems of Japanese knotweed (*Fallopia japonica*) 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. Refer to Photograph 8, in Appendices	Fell to ground level	<10	U	0	0.00

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G24	NA	Chanticleer pear	11	225	3	3	3	3	2	2	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	1	1	1	1	1	1	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
53	2299	Deodar cedar	19	700	11	12	11	10	1	1	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. Refer to Photograph 11, in Appendices	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	1	1	1	1	0	0	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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
60	429	Common lime	20	800	10	10	10	10	5	2	M	**Protected under Tree Preservation Order** Specimen tree of good form in grounds of historic house. Refer to Photograph 12, in Appendices	May require access facilitation pruning	40+	A 2	290	9.60
61	430	Silver birch	14	325	5	4	5	5	2	2	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	5	3	5	5	4	3	EM/ M	Tree of good form located between buildings	None	20-40	B 2,3	82	5.10
63	432	Silver birch	12	225	3	3	2	4	4	4	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	2	2	2	2	3	1	EM	Tree of average form located between buildings	None	20-40	C 2	34	3.30
65	1645	Young' s weeping birch	4	250	4	3	4	4	2	1	EM	Tree of average form located between buildings	None	20-40	C 2	28	3.00

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
72	425	Silver birch akin to var. 'Obelisk'	18	325	2	4	4	3	3	5	EM/ M	Tree of reasonable form	None	20-40	B 2,3	48	3.90
73	1650	Silver maple	16	525	6	7	7	7	4	2	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	4	5	4	4	2	3	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	4	4	4	4	2	3	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	6	7	8	6	4	2	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	1	1	1	1	1	1	Y	Located in shrub beds within courtyard	None	40+	C 2	5	1.20
G27	NA	Ornamental flowering cherry, Himalayan birch, hornbeam	4	75	1	1	1	1	2	2	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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G29	NA	Chanticleer pear	8	225	2	2	2	2	2	2	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	3	3	3	2	3	1	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	3	3	3	3	2	2	Y	Generally, an insignificant group of fair-average form. Planted within shrub beds and amenity grass areas in close proximity to buildings. The magnolia are an unusual species and variety. Refer to Photograph 13, in Appendices	The magnolia x 4 could be transplanted.	20-40	C 2	10	1.80
H3	NA	Cherry laurel, dwarf conifer, yucca, firethorn, variegated holly	3	100	2	2	2	2	0	0	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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G32	NA	Hornbeam, cherry	5	125	2	2	2	2	2	2	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	6	5	5	5	2	2	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	3	3	5	2	3	4	EM	Tree of poor form with decaying pruning wound at 2-m AGL	Consider removal	10-20	C 2,3	18	2.40
87	412	Apple	10	250	3	5	5	4	2	2	EM/ M	Tree of average form.	If retained undertake renovation pruning	10-20	C 1,3	28	3.00
88	413	Apple	10	325	4	5	3	6	2	0	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

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N S E W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)

Detailed Condition Inspection.

Remarks

Basal stem diameter = 1080-mm.
Minimum Required Sound Wall Thickness (Safety Factor) Mattheck) @ 0.35 = 189-mm.

Small cavity at base to the north. A metal probe 450-mm in length extended to its full length into the cavity, detecting a hollow and then extensively decayed wood.
Using a sounding hammer basal decay is detected >180 degrees of stem circumference up to 1.2-m AGL.
Broad and fractured north-west buttress to side of cavity, with suspected fracture running up to 1.8-m AGL with columns of reaction wood to either side.
Broad buttress and structural roots have developed to the east side of the cavity. However, initial inspections using a probe would suggest one of the structural roots may have been severed at 1.2-m proximal to the stem, hence the decay in this structural root, noted using a sounding hammer. A probe extends 870-mm into a hollow at 500-mm proximal to the stem where the exposed structural root forks. Decay is noted in both root buttresses on the underside in this section extending into the stem. The exposed section of the adjoining structural root does not seem to have been severed, certainly as far as 2.5-m proximal to the stem.

Fibre buckling is noted at the base of the columns of reaction wood to east and west and possible helical fractures suggests weed creep due to crown torsional loading being transferred into the stem.

Lateral limbs form at 3-m AGL, the south-western one is displaying signs of subsidence with a gap noted in the crown and a reaction wood column forming on the compression side. The upper side is occluded by ivy and hidden from view.

The formation of a rib on the north side of the union with the south-west lateral limb formed at 3-m AGL suggests torsional loading from the prevailing wind making it prone to 'cupboard door' type failure.
To the north side of the rib there is a large pruning stub.
Several wind fractured limbs and primary branches were noted.
Early signs of crown dieback with young shoots within the internal crown suggesting an early survival strategy for crown retrenchment and/or in reaction to condition issues.

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
91	405	Black mulberry	11	550	4	5	4	5	2	1	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	8	8	7	8	2	2	M	**Protected under a Tree Preservation Order.** Specimen tree of good form. Refer to Photograph 16, in Appendices	Branches may need to be temporarily tied up or back for access of machinery. .	40+	A 1,2	177	7.50

Detailed Condition Inspection.

Remarks.

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 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.

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
96	4542	Silver birch	14	350	4	4	2	4	4	4	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
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	2	2	2	2	2	1	Y	Tree of good form on edge of bank	None	40+	C 2	10	1.80
100	4544	Foxglove tree	16	850	7	6	7	8	5	3	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. Refer to findings of detailed condition inspection below.	Ecologist to inspect for bats prior to works commencing. Implement recommendations, below.	20-40	U	327	10.20

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
West = Fail East buttress = decay occurs at 200-mm South-east buttress = decay occurs at 200-mm **Recommendations.** 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.																
101	4545	Copper beech	18	600	6	7	7	7	2	1	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. Refer to Photograph 18a, in Appendices	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	7	5	3	5	3	1	EM/M	Tree of poor form. Typically, congested crown with crossing branches. Refer to Photograph 18a, in Appendices	Consider removal otherwise Remove deadwood, crossing branches and thin crown by 15%.	10-20	C 1	55	4.20

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	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	2	2	2	2	0	0	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	3	5	4	4	2	2	EM	Tree of good form in garden of former nursery	None	40+	B 2	41	3.60
109	NA	Rowan	6	125	1	2	1	2	1	2	Y	Tree of reasonable form in garden of former nursery	None	40+	C 2,3	7	1.50
110	447	Lawson cypress	9	200	2	2	2	2	0	0	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	2	1	2	2	3	2	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	8	5	7	8	6	4	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.	Consider removal	20-40	C 2,3	72	4.80

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
Trees Adjoining the Public Right of Way to North & North-West of Site (includes trees on adjoining public and private land)																	
G34 a	NA	Hazel, hawthorn	10	150	3	5	4	4	0	2	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	4	4	4	4	2	2	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	3	3	2	2	0	0	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	8	8	11	10	4	4	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	4	3	5	4	3	2	EM/ M	Remnant unkempt native banked hedge. Occasionally sporadic.	Subject to ownership, fell dead hawthorn to south of G35a.	40+	B 2,3	28	3.00

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G36	NA	Ash, field maple	13	300	3	5	5	4	2	1	EM	Four trees of fair form in close proximity to boundary fence.	None	40+	C 2,3	41	3.60
H6	NA	Leyland cypress with mixed broadleaves & a cherry laurel	11	200	3	3	3	3	2	2	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	2	2	2	2	2	2	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
120	NA	Pedunculate oak	12	450	6	6	7	4	2	4	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.	Subject to ownership, remove overhanging deadwood to path	40+	B 2,3	92	5.40

Tree Number	Tree Tag	Species	Height (M)	Effectual Diameter (mm)	Branch Spread N	S	E	W	1st Significant Branch	Canopy Clearance	Life stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	Root Protection Area (M2)	Root Protection Radius (M)
G39	NA	Ash, hawthorn	10	150	3	4	2	2	2	3	Y/EM	Two ash 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
123	NA	Sycamore	16	500	5	6	5	5	4	1	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	6	7	5	5	3	1	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

Statute and Common Law.

A landowner or land manager should be aware that both statute and common law dictates that 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. The part of the statute law that relates to this responsibility is governed by the Occupiers' Liability Act (1957 & 1984) in the case of England and Wales and most prosecutions are brought under this heading. In addition, a landowner has a "Duty of Care" see court case reference…British Road Services v Slater & Another [1964] Vol. 1, Weekly Law report 493-497

A person suitably qualified in arboriculture should undertake such routine inspections and any remedial tree works recommended should be carried out within the time constraints specified, to prevent injury or damage occurring. A landowner should retain records of all inspections and any remedial tree works that have resulted from such inspections. Arboricultural Association, the Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire, GL10 3DL. Telephone 01242 522152.are able to provide advice on suitably qualified persons or indeed suitable qualifications a person should hold to undertake qualified inspections.

9. LIMITATIONS OF THIS REPORT

It must be stressed that this report is a pre-development survey and not a risk assessment or a detailed report on the health and condition of the trees. Whilst any obvious problems noted during this ground level inspection may be noted, general comments are made based on a somewhat cursory, visual inspection. In addition, future management may receive a mention or be briefly discussed but such comments are general comments only, for basic information, which should not be taken to form immediate or long-term management plans nor do they replace the need for having professional management plans for groups, areas or woodlands.

Trees are living dynamic organisms which can be affected by external environmental conditions and very occasionally internal biological symptoms that are not visible, causing failure without warning. It is therefore not possible to state with any certainty that any tree is completely safe. There are occasions when even healthy and completely defect-free trees break or become windblown. This represents a "normal failure rate" which is the price of the lightweight, energy-saving structure that favours the species to compete with others in a cost-effective way.

Every attempt has been made to provide a realistic and accurate assessment of trees and their condition at the time of this inspection. No responsibility can be accepted for damage or injury as a result of the failure of any tree or its parts due to faults not apparent upon a visual inspection carried out at this season, or for faults developing subsequent to the survey. Similarly, no liability can be accepted for the condition of the trees that are obscured in part or by whole (e.g. due to dense ivy or other foliage), nor for any that proved inaccessible to the inspector. Certain features which might provide evidence of ongoing decay or decline (Such as seasonal fruiting bodies, damage to foliage, insect emergence holes etc.) may not be in evidence. Only those features present at the time of inspection could be assessed.

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

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

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

Soil testing to ascertain the plasticity index or shrinkable characteristics of the soil on the development site to provide information in relation to the likelihood of building damage caused by tree related subsidence or heave where trees are within influencing distance has not been carried out. The author cannot be held liable for building damage as a result. A soil analysis can be provided if requested.

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

Priority 3	Low Priority; the work is advised but of a lower priority than above which should be carried out before a period of 12 months' lapses.
Priority 4	Minor Problems representing no immediate hazard at the time of inspection although potential for harm or hazard to develop as the tree grows or faults developing that may become significant at a later date if left to develop. Works without any immediate urgency, possibly to rectify a minor fault or to abate a nuisance present or developing.

Root Protection Area this is a protection area established for around the base of each tree to prevent physical, chemical or compaction damage occurring. This is usually achieved through the erection of fencing or other barriers.

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

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 an 'Arboricultural Method Statement' and the supervision of an Arborist.

- *All measurements given are approximate.*
- *AGL: an abbreviation for above ground level.*

11. GLOSSARY OF TERMS

Adaptive Growth; in tree biomechanics, the process whereby wood formation is influenced both in quality and in quantity by the action of gravitational force and mechanical stresses on the cambial zone (THIS HELPS TO MAINTAIN A UNIFORM DISTRIBUTION OF MECHANICAL STRESS)
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.
Anchorage; in trees, the holding of the root system within the soil, involving the flow of forces from the stem through the branches of the root system to the cohesive root/soil interface.
Architecture; in a tree, a term describing the pattern of branching of the crown or root system.
Assessment; in relation to tree hazards, the process of estimating the risk which a tree or group of trees poses to persons or property (THIS INVOLVES A VISUAL INSPECTION FOR DEFECTS AND CONTRIBUTORY SITE FACTORS, AND SOMETIMES ALSO A DETAILED INVESTIGATION OF SUSPECTED DEFECTS)
Assym; This abbreviation means…asymmetric…and refers to the tree having an asymmetric or unbalanced crown. This is usually preceded by a measurement in metres which provides the extent of crown asymmetry and is measured from the centre of the trunk. It may also have a correlation to the lever arm
Arboriculturalist: person who has, through relevant education, training and experience, gained recognised qualifications and expertise in the management of trees generally and in relation to construction.
Architecture: in a tree, a term describing the pattern of branching of the crown or root system.
Arboricultural Implication Assessment (AIA) study, undertaken by an 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
Canopy: the topmost layer of twigs and foliage in a woodland, tree or group of trees
Construction Exclusion Zone; area based on the RPA (meters as a radial measurement and sometimes a m^2), identified by an Arboriculturalist, to be protected during development, including demolition and construction work, by use of barriers and/or ground protection fit for the purpose to ensure the successful long-term retention of a tree.
Crown: in arboriculture the main foliage-bearing portion of a tree containing the leaves and branches
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.
Dysfunction: in woody tissues, the loss of physiological function, especially water conduction.
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).
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.

APPENDIX A - TABLE 1 TREE QUALITY ASSESSMENT

The trees are categorised as stated within the British Standard in a way that should help assist those within local government to help form a balanced judgement. The primary purpose of this report is to provide an assessment of the trees and to determine their suitability for retention in any proposed development.

The Tree Categories used in evaluating the trees on this site are reproduced below. This categorisation is also included in the tree data schedules and by colour code on the attached plan.

Category and definition Criteria (including subcategories where appropriate)

Category U
Trees unsuitable for retention (see Note)

Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years

- ✓ Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)
- ✓ Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline
- ✓ Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low-quality trees suppressing adjacent trees of better quality

*NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7.*** See Table 2

Trees to be considered for retention

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

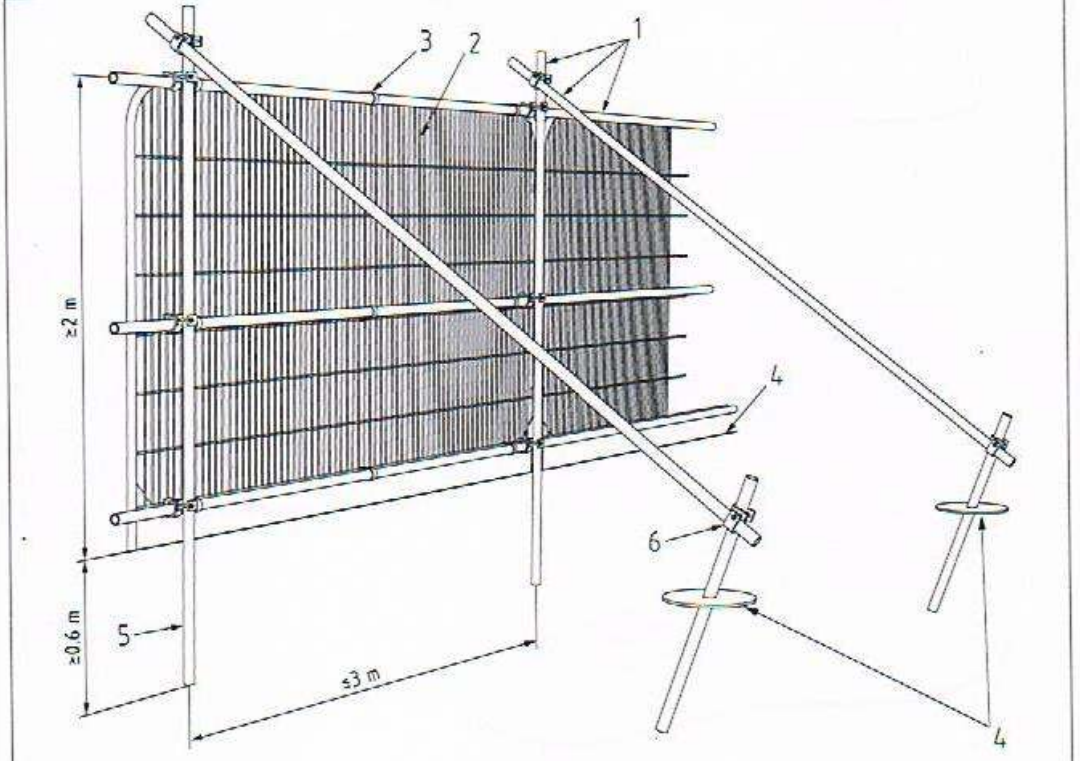
- ✓ 1 Mainly arboricultural qualities- Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)
- ✓ 2 Mainly landscape qualities- Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features
- ✓ 3 Mainly cultural values, including conservation- Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture) See Table 2

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

- ✓ 1 Mainly arboricultural qualities- Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation
- ✓ 2 Mainly landscape qualities- Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality
- ✓ 3 Mainly cultural values, including conservation- Trees with material conservation or other cultural value See Table 2

APPENDIX B - DEFAULT SPECIFICATION FOR PROTECTIVE BARRIER

Figure 2 **Default specification for protective barrier**



Key

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

APPENDIX D - PHOTOGRAPHS

Photograph 1. Lime with *Kretzschmaria deusta* decay fungi with associated crown symptoms.



Photograph 2. Lime with *Kretzschmaria deusta* decay fungal fruiting bodies at base.



Photograph 5. Tree 31: Poorly removed stems x 3, resulting in large developing decay wounds (one is indicated with the red arrow below).



Photograph 7. Tree 43: Oak with crown dieback.



Photograph 8. Tree 52: Cherry with failing compression fork.



Photograph 11. Tree 53: Specimen cedar.



Photograph 12. Tree 60: Specimen lime tree in grounds of historic building.



Photograph 15. Tree 91: Mulberry with failing compression fork temporarily braced with a ratchet strap.



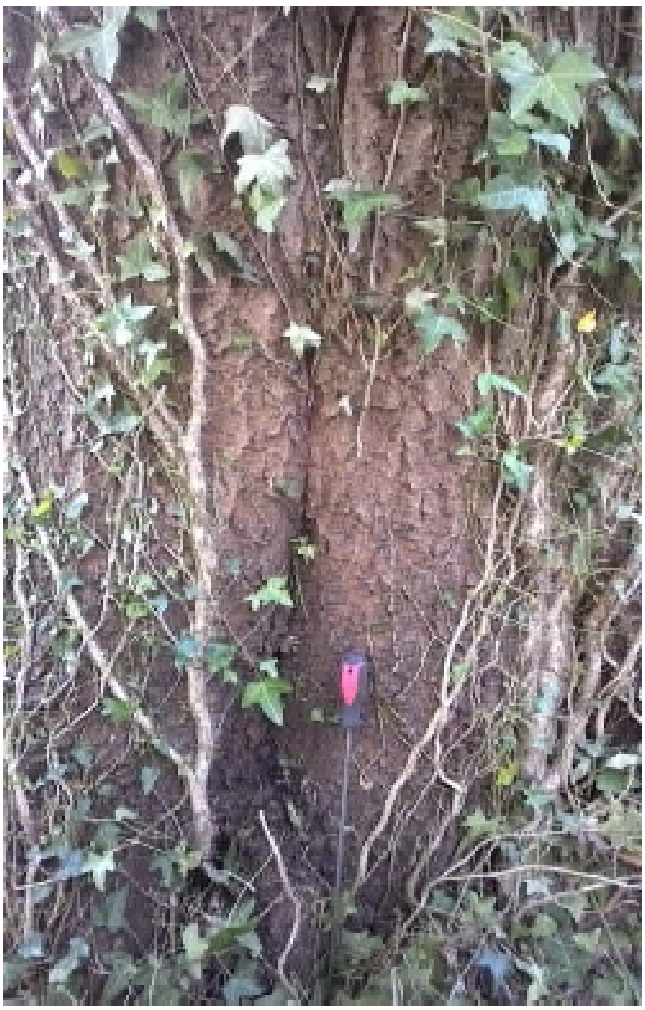
Photograph 16. Tree 91: Specimen Walnut of good form



Photograph 18b. Tree 100 – decaying north side of Foxglove tree with stem swelling in response to significant decay.



Photograph 18c. Tree 100 – potential fracture above decayed buttress.



Photograph 19a. Tree 90 – Foxglove tree with small but deep cavity >450-mm leading to hollowing of stem and extensively decayed wood. Photograph shows inspector inserting a 450-mm probe to its full depth.



Photograph 19b. Tree 90 – Notable stem swelling due to decay and potential fracture through buttress up to 1.8-m above ground level..



Photograph 19e. Tree 90 – Exposed structural roots with the right one seemingly having been severed as the inserted probe indicates. A hollowing and decay occurs under the fork between these structural roots.



Photograph 19f. Tree 90 – Lateral limb with signs of subsidence (note the gap between it and the crown section above).



Photograph 21b. Group 7. Tree 125 -Plum forks with an elongated narrow decay cavity to the north between 1.8-m - 3-m AGL. Fractured and partially attached limb at 3-m AGL.

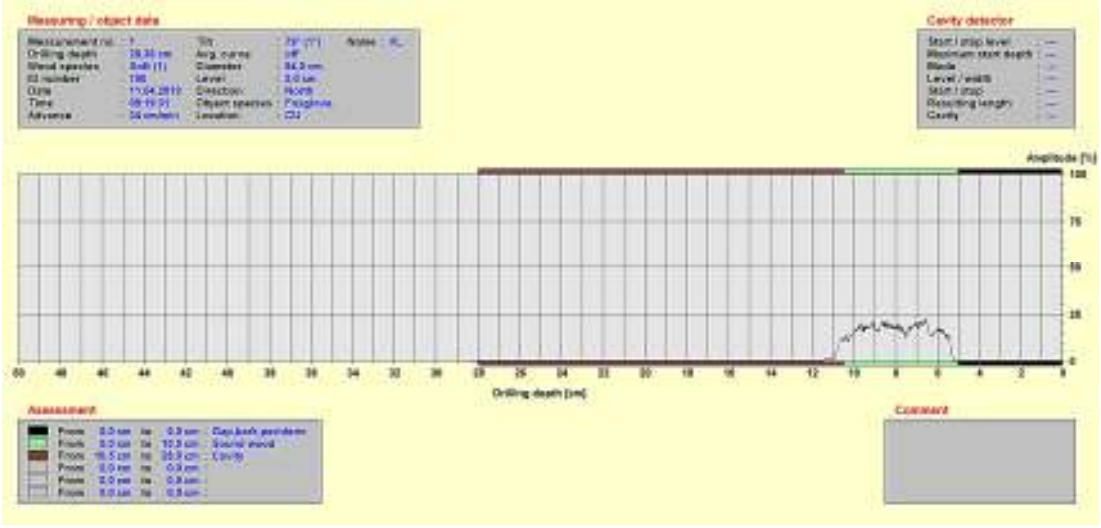


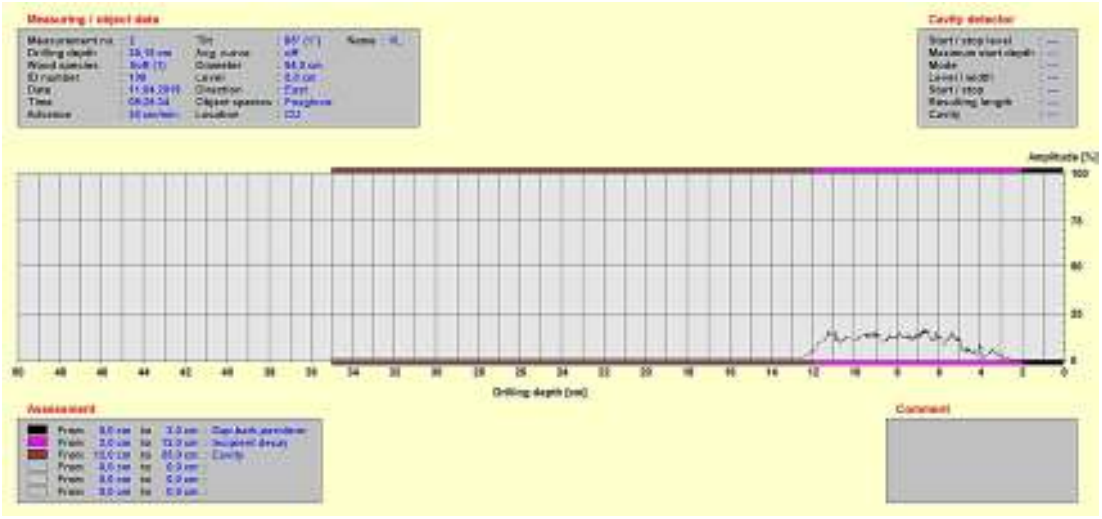
Photograph 21c. Group 7. 126 – Apple with elongated narrow decay cavity between 0.3-m – 1.1-m AGL to a depth of 50-mm. Congested crown with multiple crossing branches.

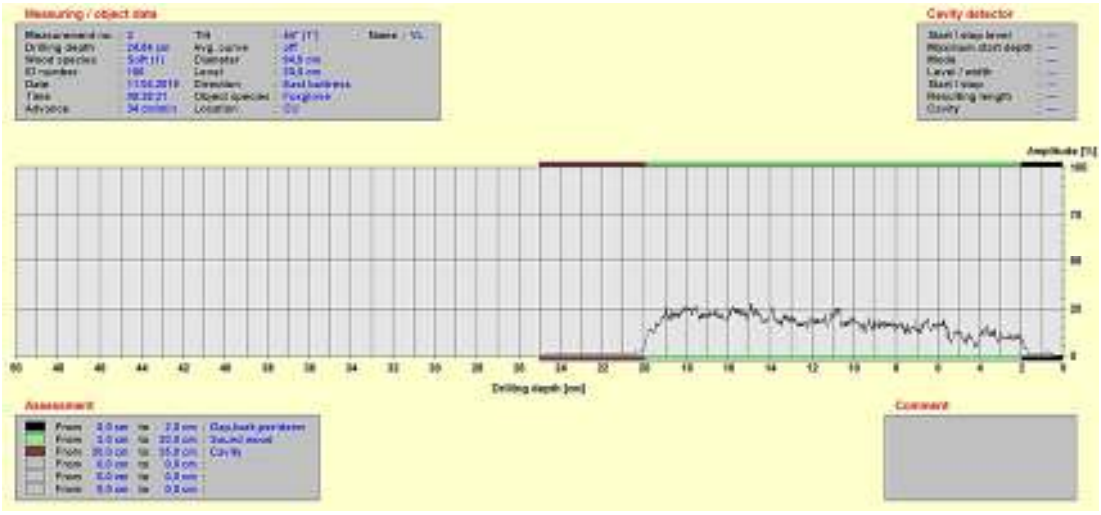


RESISTOGRAPH READINGS

Tree 100. Foxglove tree (*Paulownia tomentosa*)

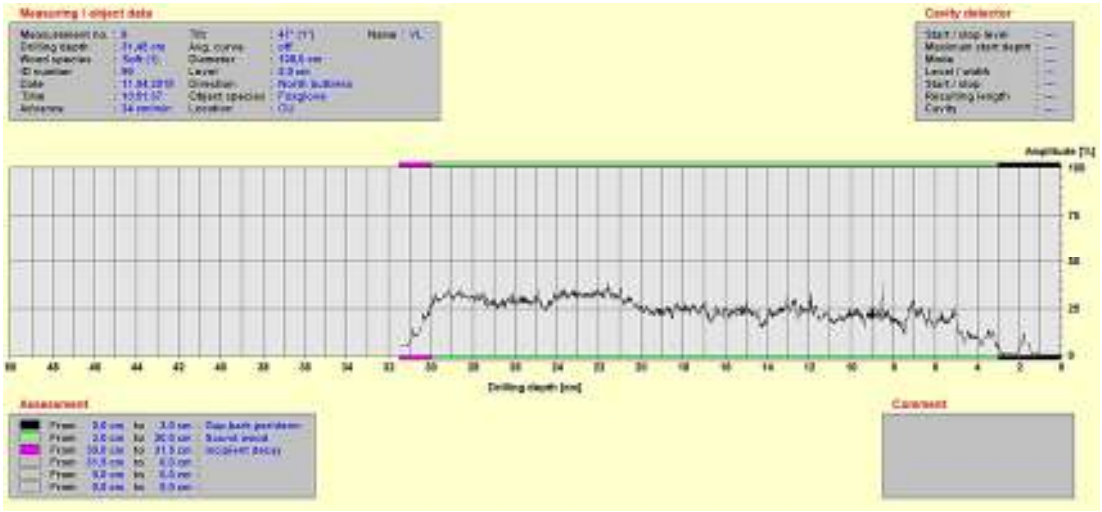






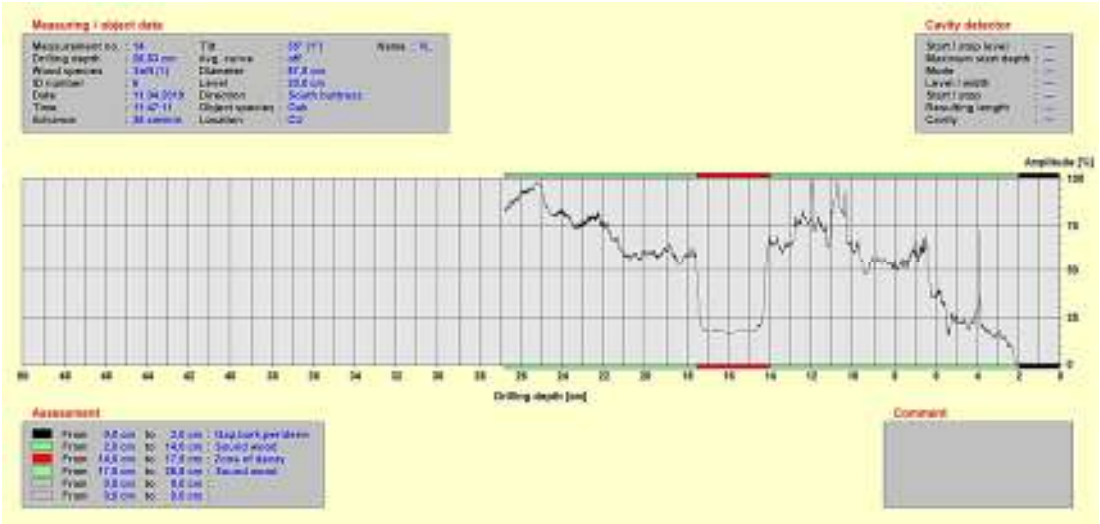
Tree 90. Foxglove tree (*Paulownia tomentosa*)








Measuring / object data
Cavity detector
Amplitude [%]
Drilling depth [cm]
Assessment
Comment


Measuring / object data
Cavity detector
Amplitude [%]
Drilling depth [cm]
Assessment
Comment


Measuring / object data
Cavity detector
Amplitude [%]
Drilling depth [cm]
Assessment
Comment

Appendix EDP 7
Bat Mitigation Plan
(edp5601_d034b 27 September 2021 DJ/EW)



client

Redrow Homes (South Wales) Ltd

project title

USW Caerleon

drawing title

Bat Mitigation Plan

date	**27 SEPTEMBER 2021**	drawn by	**DJ**
drawing number	**edp5601_d034b**	checked	**EW**
scale	**1:2,000 @ A3**	QA	**GY**

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