

LIZARD

Landscape Design and Ecology

ARBORICULTURAL IMPACT ASSESSMENT AND METHOD STATEMENT

**NATIONAL TRUST SLINDON ESTATE
DUKES ROAD, SLINDON, WEST SUSSEX**

Phillips Surveyors

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1.0 INTRODUCTION

- 1.1 Lizard Landscape Design and Ecology has been commissioned to undertake a dendrological survey and produce arboricultural documentation for the proposed development at National Trust Slindon Estate, Dukes Road, Slindon, West Sussex.
- 1.2 The Arboricultural Impact Assessment and Method Statement report provides assessment of the direct and indirect effects of the proposed design and where necessary recommends mitigation.
- 1.3 The Arboricultural Impact Assessment and Method Statement report for the development at National Trust Slindon Estate has been prepared by Will Mills (*MSci (Hons); Consultant Ecologist; Lizard Landscape Design and Ecology*) and has been reviewed by George Sayer (*MCIEEM MArborA; Senior Ecologist; Lizard Landscape Design and Ecology*)
- 1.4 This written Arboricultural Impact Assessment and Method Statement should be read in conjunction with the associated tree survey documentation, including *LLD2493-ARB-DWG-001 – Tree Constraints Plan*, *LLD2493-ARB-SCH-001 – Existing Tree Schedule* and *LLD2493-ARB-DWG-002 – Tree Retention and Protection Plan*.

Existing Site Information

- 1.5 The site area consists part of the National Trust Slindon estate adjacent to South Lodge on Dukes Road, Slindon (*grid reference SU 95367 07272*). The site is dominated by ancient deciduous woodland with associated bridleways and footpaths. The development proposals include the replacement of an existing wire fence with a more substantial metal fencing, and the creation of a new footpath and re-routing of an existing bridleway.

Existing Site Vegetation

- 1.6 Trees within the main area of the site consist of mature deciduous species including, beech, silver birch, and ash. Most trees are in a good state of health and are of an A or B category. The trees on site form part of an ancient woodland which has minimal understory.

- 1.7 The shaw of trees located on the western side of Dukes Road, consist of semi-mature and mature deciduous species including hawthorn and field maple, likely planted as screening for the A27 to the south. These trees are planted very close together forming a dense thicket.

Development Proposal

- 1.8 The development proposals include the replacement of the existing fence along the northern boundary, the repair of the existing bridleway and the re-alignment of the bridleway access point on Dukes Road.

2.0 ARBORICULTURAL IMPACT ASSESSMENT

Impacts of Development Proposals on Existing Vegetation

- 2.1 The proposed development can have an adverse impact on the existing trees by removing them to facilitate the development, or in the future, by adversely affecting their potential for retention through disturbance in Root Protection Areas (RPAs) or through post development pressures to prune or remove.
- 2.2 The development proposals would involve the following site operations that could impact upon the existing trees:
- Contractor movements; site access and operations;
 - Storage and compound;
 - Plant, vehicle and material cleaning;
 - Installation of construction elements; ground work / general site operations;
 - Construction in proximity to trees;
 - Removal of existing structures;
 - Future maintenance;
 - Removal of existing vegetation not for retention;
 - Removal of protective measures.
- 2.3 Potential impacts for existing trees to be retained within the proposals include the compaction of soils and disturbance/damage to the roots within RPA's from inadequate protection measures or improper construction methods. Such impacts would be of a high magnitude and could lead to the deterioration of tree health possibly resulting in their failure.

Tree Retention and Protection

- 2.4 All trees on site are to be retained within the proposal wherever possible, most of which are mature trees in a good state of health and of a high category (A/B). Trees shall be protected using tree protection fencing where appropriate.

Disturbance to Root Protection Areas

- 2.5 The removal of the existing fence and the installation of the proposed replacement fencing within the root protection areas of trees along the bridle way are included within the proposed works. The proposed replacement fencing will consist of support posts of approximately 50.0 X 30.0mm of a metal construction. Possible impacts could include the damage/destruction of major tree roots from inappropriate placement or construction methods. Such impacts have the potential to have a significant effect on tree health which may result in failure. These impacts shall be mitigated through the implementation of 'Manual Excavation' construction methodologies (see 3.9 for further details).
- 2.6 The repair of the existing bridleway within the root protection areas of trees along the northern boundary could result in potential impacts of which could include the damage/destruction of major tree roots from inappropriate construction methods, and compaction or loss of rooting environment. Such impacts have the potential to have a significant effect on tree health which may result in failure. These impacts shall be mitigated through the implementation of 'No Dig' construction methodologies (see 3.11 for further details). This specialist construction will only be required in small, discrete areas where repairs are required (*as shown on the LLD2493-ARB-DWG-002 – Tree Retention and Protection Plan*) and no general vehicular access will be required or possible in these areas. Specialist construction will be undertaken under arboricultural supervision to ensure this is carried out correctly.
- 2.7 The re-aligning of the existing bridleway on to Dukes Road, within the root protection areas of trees could result in potential impacts of which could include the damage/destruction of major tree roots from inappropriate construction methods. Such impacts have the potential to have a significant effect on tree health which may result in failure. Trees affected by the re-alignment are T03, T04 and T05. These impacts shall be mitigated through the implementation of 'No Dig' construction methodologies in combination with tree protection fencing (see 3.11 for further details).

Construction in Proximity to Existing Trees

- 2.8 The re-alignment of the bridal way will be within the RPA of T03, T04 and T05, to minimise disturbance to roots the existing ground where the proposed bridleway is to installed shall be overlain with a geo-membrane and covered with a granular fill of no finer than - open graded aggregate Type 3 incorporated within a 3-dimensional cellular confinement system. This should ensure a minimum supportive depth of 100mm, above which a permeable surface treatment could also be laid if required. The pH of the aggregate must be near neutral to avoid damage to pH-sensitive tree species.
- 2.9 To minimise any potential disturbance to the roots of trees the foundation holes for the replacement fencing shall be made using either hand tools or 'air spade' techniques as this will allow for the detection and protection of major tree roots. The holes will be of the smallest size possible to minimise root disturbance. Should any roots be encountered, only roots under a diameter of 25mm will be able to be removed via cutting cleanly and the 'live' end wrapped in hessian. Any larger roots (i.e. 25mm or greater in diameter) shall be retained and either carefully re-buried or wrapped in hessian till works are completed. Should the initial hole be found to be full of major roots, the hole will be carefully infilled and a new location selected for the fence post installation. Care shall be taken whilst infilling any holes to ensure minimal soil compaction within the RPA of surrounding trees.
- 2.10 Any use of concrete for gate posts etc. shall be undertaken with due care to avoid concrete leaching harming roots. Any concrete shall be poured into holes lined with geotextile.
- 2.11 The alterations do not significantly alter the risk of falling trees or limbs with most trees being semi-mature woodland specimens. As such, future pressures to prune trees as a result of the proposals are minimal.

Tree Pruning, Canopy Reduction or Lifting

- 2.12 Within the proposed works it is required to lift the crowns of boundary trees comprising of a small shaw on the junction of the A27 and Dukes Road (TG 06). The trees are a closely planted native tree group of hawthorn and field maple which over shade each other. The crown lifting would improve pedestrian and driver visibility, particularly for those wishing to cross the road from the western side of Dukes Road. Currently the clear stem of the trees is approximately 0.5m, this will be lifted to a height of 3.0m. Impacts to the trees in the longer-term will be of a minor magnitude.
- 2.13 A semi-mature Silver birch was found to have a major tear out of leader from a height of 5.0m with exposed heartwood, the closest surrounding leaders also display exposed heart wood and damage. In the interest of public safety (*should the dead leader fail and fall onto the footpath below*), it is recommended that it be removed to a height of 4.75 m within the scheme of works. As a birch tree, the tree is unlikely to survive in the longer-term (*i.e. beyond 10 years*) but the tree will become a useful habitat feature for invertebrates. Details of the tree can be found below;

T01 – *Betula pendula* min RPA 3.0m – Category C

Removal of Trees and Vegetation

- 2.14 All trees on site are to be retained within the proposals.
- 2.15 A small section of bramble and spindle scrub is required to be removed to facilitate the re-alignment of the bridal way onto Dukes Road.

Tree Loss Mitigation Measures

- 2.16 None required, all trees on site are to be retained within the proposals.

3.0 ARBORICULTURAL METHOD STATEMENT

Protection and Retention of Existing Trees and Habitats

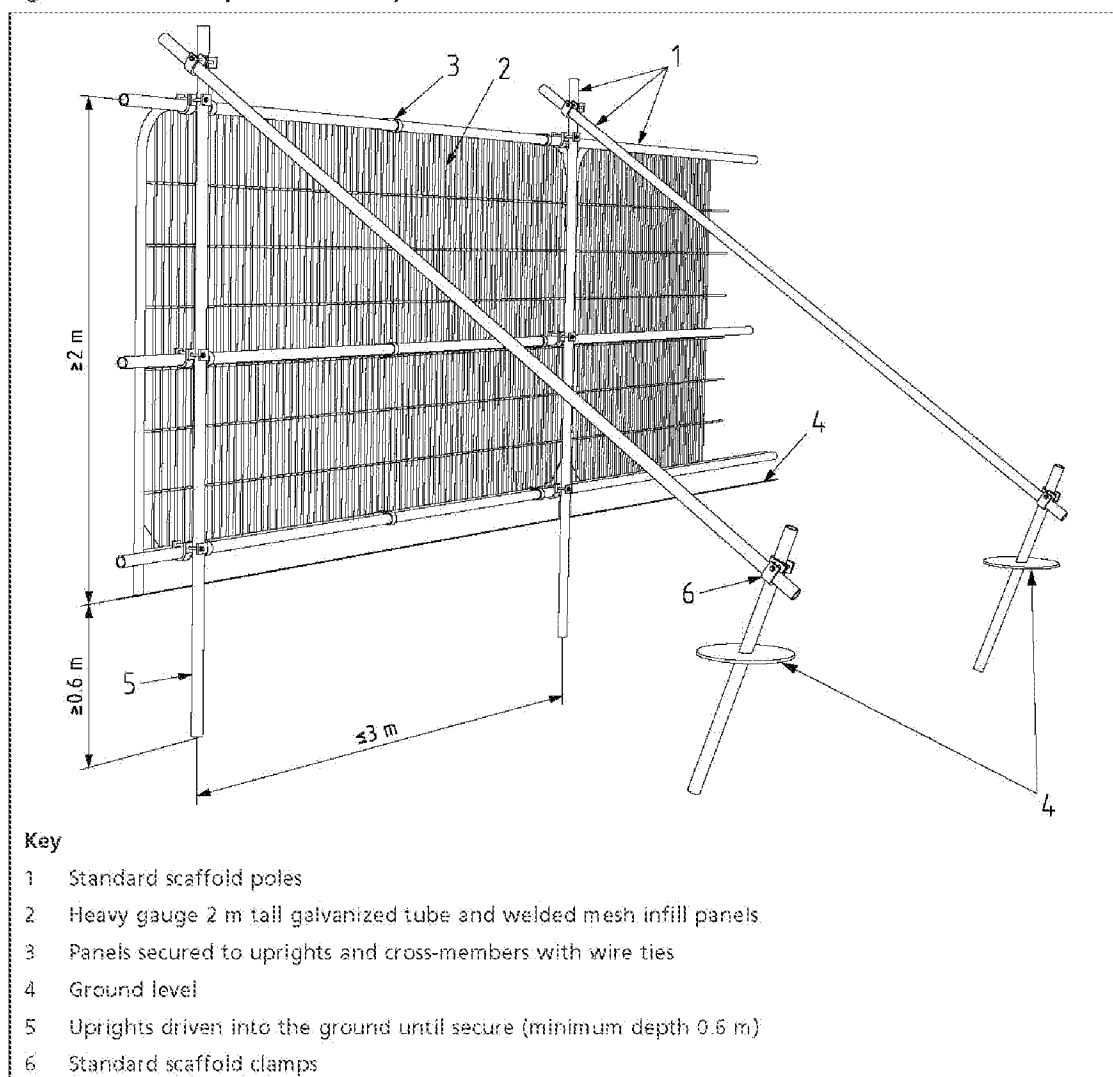
- 3.1 The Contractor shall exercise due care when performing operations beneath the canopy of existing mature trees and vegetation designated for protection and avoid at all times damage to the roots, trunk and branches.
- 3.2 The Contractor shall train all members of the construction workforce operating within the proximity of valued habitats and make such persons aware that there shall not be, without having sought prior notification, the following operations undertaken within the protected areas:
- Dumping of spoil or rubbish, excavation or disturbance of topsoil, parking of vehicles or plant, storing of materials or placing of temporary accommodation within an area which is the larger of the branch spread of the tree or an area with a radius of half the tree's height, measured from the trunk, and within the specified Root Protection Areas;
 - Severance of roots exceeding 25 mm in diameter. If unintentionally severed; notice shall be given and specialist arboricultural advice sought;
 - Changes to the level of the ground within the specified Root Protection Areas;
 - Vegetation clearance to site boundaries during the bird nesting season (nesting season: March-September inclusive). Any clearance must be undertaken outside nesting season or alternatively under a watching brief from a suitability qualified ecologist.

Tree Protection Barriers

- 3.3 The Contractor shall exercise due care when performing operations beneath the canopy of existing mature trees and vegetation and within the specified Root Protection Areas designated for protection and avoid at all times damage to the roots, trunk and branches of existing trees proposed to be retained.
- 3.4 All trees to be retained on site shall be protected with barriers erected around the area of mature vegetation in accordance with *BS 5837; 2012; 'Trees in Relation to Design, Demolition and Construction - Recommendations'*. The barrier shall be installed, protected and maintained during the main works by the Contractor who shall be responsible for protecting any area beneath the canopy of the existing trees and within the specified Root Protection Areas.

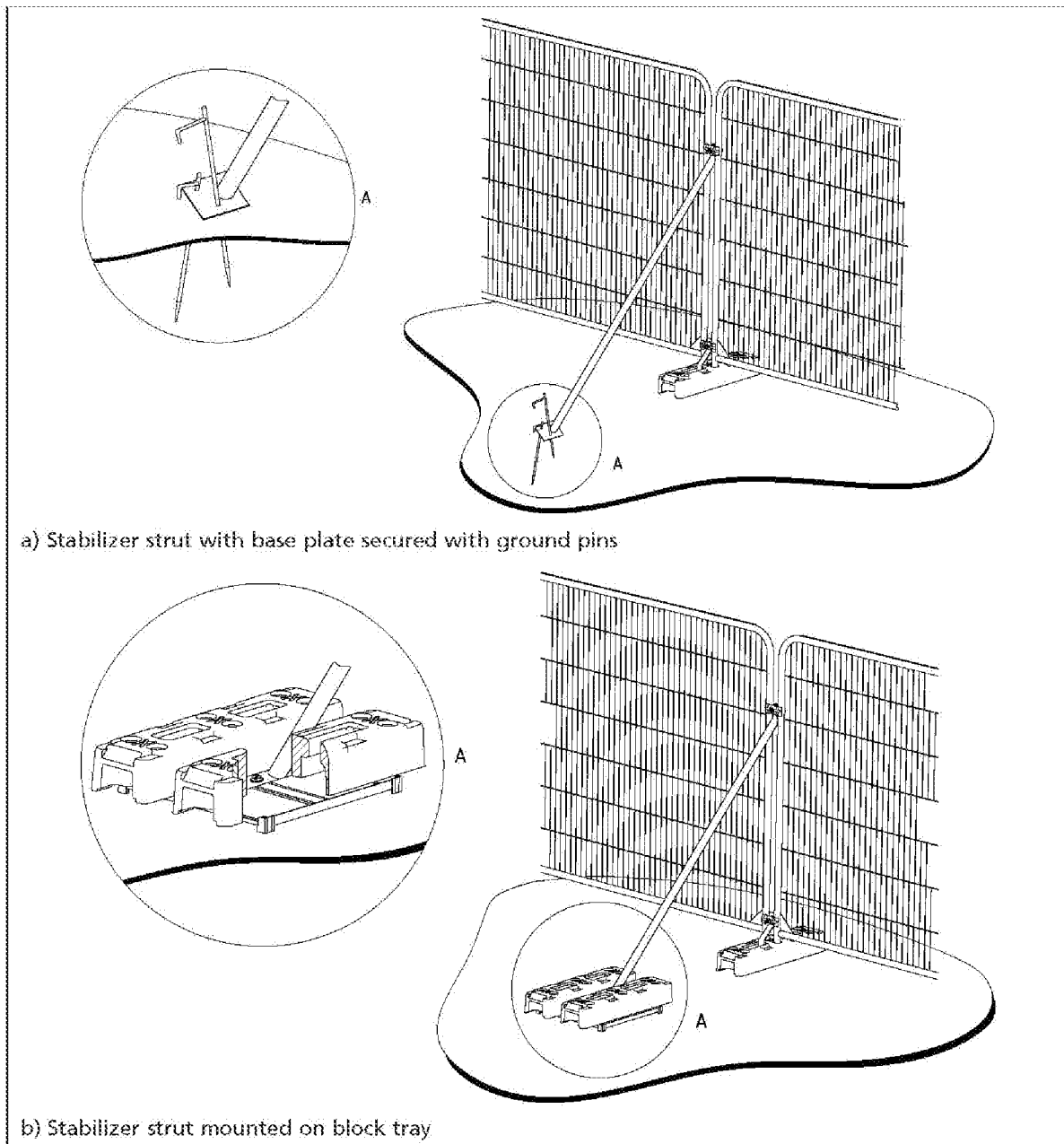
- 3.5 The installed protective barrier shall be 2.0 metres minimum height 'Heras' Welded Wire Mesh Fencing secured to a scaffolding framework, set into the existing ground, and positioned to the outside edge of the existing Tree Root Protection Area. Where existing ground conditions do not allow for the above method, the Welded Wire Mesh Fencing Panels may be mounted on concrete or rubber feet, supported on the inner side with stabilizer struts fixed on a block tray or secured with ground pins; and positioned as specified. The barrier should be strained, and fixed to fences, walls, knee rails where possible to provide a complete protected area (refer to Figure 2 and Figure 3 below; © British Standards Institute 2012). All tree protection to be in accordance with BS 5837: 2012; 'Trees in Relation to Design, Demolition and Construction - Recommendations' set out as specified within drawings LLD2493-ARB-DWG-002 – Tree Retention and Protection Plan.

Figure 2 Default specification for protective barrier



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Figure 3 Examples of above-ground stabilizing systems



- 3.6 Day-glo ribbons shall be maintained during the main works by the Main Contractor attached to the top of the barrier to ensure that the fencing is clearly visible during the works. The tree protection barrier shall display all-weather notices starting '*Construction Exclusion Zone – NO ACCESS*'.
- 3.7 All such barriers shall be maintained for the full contract period. All necessary excavations, earthworks and cultivation beneath the canopy spread of any existing tree; shrub or hedge shall be undertaken by hand. *No commencement of construction operations should occur prior to the inspection of the installed tree and ground protection by the Landscape / Arboricultural Consultant.* Repositioning of the protective barrier during the course of the contract as the contract works progress shall need prior consultation with the Landscape / Arboricultural Consultant.
- 3.8 Within the protected areas the following activities must not take place;
- No vehicles are to be used in the fenced off areas;
 - No materials are to be stockpiled or stored;
 - No chemicals are to be stored;
 - No excavation or increase in the soil level shall occur;
 - No fires shall be lit on site.

Manual Excavation

- 3.9 Where the development proposals necessitate the tying in and re-grading of existing and proposed levels for the proposed fencing; a '*Manual Excavation Method*' must be assumed using hand held tools to minimise the impact on existing trees. The excavation should be executed with due care and attention not to disturb exposed unmade ground and any existing tree roots present within it.
- 3.10 Roots over 25mm diameter or those occurring in clumps must not be severed without Arboricultural advice. Tree roots below such size should be cut cleanly using specialised hand tools only and to the minimum extent to allow provision. All exposed roots should be immediately wrapped in dry Hessian to avoid drying. On completion of the excavation and at the earliest opportunity the wrapping should be removed, and the roots surrounded and protected with a loose granular fill (clean washed sharp sand or topsoil free of contaminants or matter injurious to rooting systems) prior to backfilling the excavation to the desired levels.

New Surfacing and Means of Access within Root Protection Areas – ‘No Dig’

- 3.11 Where new surfacing and means of access within Root Protection Areas have been proposed, the construction method should be implemented to avoid intrusion into or change of existing ground levels within the tree Root Protection Areas of existing trees.
- 3.12 A ‘No Dig’ Construction should allow for the paving of specified areas within or adjacent to tree Root Protection Areas to be constructed without disturbance to root systems.
- 3.13 Ground levels should not be raised or lowered within the existing tree Root Protection Areas. A permeable surface treatment should be laid over the existing ground allowing water to permeate, and allow for nutrient access and gaseous exchange.
- 3.14 The construction area / existing ground within the existing tree RPA is to be overlain with a geo-membrane and covered with a granular fill of no fines - open graded aggregate Type 3 incorporated within a 3-dimensional cellular confinement system. This should ensure a minimum supportive depth of 200mm for vehicular access / 100mm for pedestrian footpaths, above which a permeable surface treatment should be laid. The pH of the aggregate must be near neutral to avoid damage to pH-sensitive tree species.
- 3.15 Existing paving material overlying the RPA of existing trees should be left undisturbed during the construction period in order to protect the Root Protection Area of the tree to be retained. The existing paving/ hard standing can then be reused as a base for the proposed surfacing, subject to Engineer’s specification.
- 3.16 All retaining kerb restraints / edge supports are to be secured above ground and no general excavation within existing tree RPAs should be permitted.
- 3.17 Where stepped or ramped access have been proposed within the RPAs of existing trees, this should be constructed with limited disturbance to the existing ground. A raised frame supported upon posts concreted in the ground is recommended. The holes for footing to posts should be dug out using handheld tools. The sides of the holes should be lined with an impermeable membrane to prevent the caustic and toxic effects of wet cement in the concrete from damaging tree roots.

Services in Proximity to Existing Trees

- 3.18 The location and direction of new services should be designed to allow for services to be routed away from the RPAs of existing trees. Existing service runs should always be used wherever possible.
- 3.19 Where the proposed routing of services impinges upon the tree RPA of any existing tree to be retained; the routing should be undertaken as a minimum standard in accordance with *NJUG Volume 4, issue 2: 'Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees'*.
- 3.20 A 'Manual Excavation Method' to be followed to carefully hand dug and route the apparatus most directly to and from the exterior of the RPA radius.
- 3.21 Services are to be routed together wherever possible to create the minimum impact upon the roots of the existing trees to be retained. Trench excavation across the tree Root Protection Area radius beside an existing tree should be avoided, whereby tree roots would become severed. Where services are to cross the edge of an existing RPA, they should be routed via a hand dug ducting sleeve, avoiding damage to roots.

Contractor Movements. Site access and operations. Storage and Compound Areas

- 3.22 The Contractor Site Compound shall be located outside of any prescribed tree Root Protection Area and shall be permitted for the storage and securement of materials only within a temporary compound.
- 3.23 The compound area shall be located so as to not incur damage or injury to the root systems or canopy of any existing trees or vegetation within or adjacent to the site, in accordance with *BS 5837:2012 – 'Trees in Relation to Design, Demolition and Construction – Recommendations'*. All site operations associated with the usage of the compound area shall be undertaken with due care and attention so as to negate damage of the surrounding environment.
- 3.24 All site operations and construction procedures for the duration of the construction period shall seek to protect the existing site vegetation and root protection areas in accordance with *BS 5837:2012*.

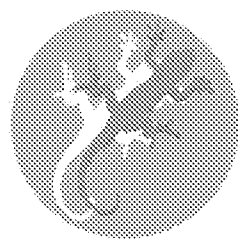
Tree Surgery

- 3.25 Any significant defects found in the trees during the course of the scheduled work shall be reported to the Landscape Architect / Arboricultural Consultant. All scheduled and arising tree work shall be undertaken by an approved and qualified tree surgeon in accordance with *BS 3998: 2010 'Tree Work: Recommendations'*. Care should be taken to avoid damage to neighbouring trees to be retained. Branches in confined spaces shall be removed and taken down in sections. All arisings shall be transported and disposed of away from site to the Contractor's tip.

Removal of Existing Vegetation

- 3.26 All existing trees to be designated for removal are to be removed in accordance with the *LLD2493-ARB-DWG-001 – Tree Retention and Protection Plan*. All tree work and removal shall be carried out in accordance with *BS 5837:2012*. Trees designated for removal and felling shall be clearly marked on site with white paint. Prior to the removal and felling of trees, the required work and tree positions shall be agreed on site with the Landscape Architect / Arboricultural Consultant. Trees shall be felled prior to the erection of the Tree Protective Fencing. Care should be taken during the tree removal process to avoid any damage to any trees which are designated to be retained.
- 3.27 Stumps shall be removed and cut away so that the top of the stump shall be at least 450 mm below the final topsoil level in order that the site can be reinstated in accordance with the existing site levels. Stumps are to be treated with an approved herbicide to be agreed with the Landscape Architect. Where the depth is greater than 450 mm the areas shall be backfilled with topsoil to the required level.
- 3.28 The removal of shrub or scrub material within the Root Protection Area of any tree to be retained shall employ a Manual Removal method; the use of hand tools shall be used in order to maintain the ground surface of the Root Protection Area and reduce any damage to existing tree roots within the protected root zone. Adjacent trees shall not be utilised as anchors or levers to facilitate the removal of adjacent vegetation.

- 3.29 Vegetation clearance to site boundaries should take place outside the bird nesting season (*nesting season: March-September inclusive*) or alternatively under a watching brief from a suitability qualified ecologist.



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