

SEAWARD PROPERTIES LTD

LAND TO THE EAST OF BARN RISE, BARNHAM

LLD1345-ARB-REP-001

Arboricultural Impact Assessment and Method Statement

Planning Issue

Prepared by	GS
Checked by	JJ
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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 of land to the east of Barn Rise, Barnham.
- 1.2 The Arboricultural Impact Assessment and Method Statement report provides evaluation 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 of land at Barn Rise, Barnham has been prepared by George Sayer (*BSc(Hons) PgDip TechArborA*); Project Ecologist at Lizard Landscape Design and Ecology, Worthing.
- 1.4 This written Arboricultural Impact Assessment and Method Statement should be read in conjunction with the associated tree survey documentation, including *LLD1345-ARB-DWG-001 – Tree Constraints Plan*; *LLD1345-ARB-SCH-001 – Existing Tree Schedule*; and *LLD1345-ARB-DWG-002 – Tree Retention and Protection Plan*.

2.0 EXISTING SITE INFORMATION

The Site

- 2.1 The site consists of a patch of well-maintained amenity grassland, surrounded by hard surfaces and a new housing development. The site contains several scattered trees, and is bounded by fences, a privet hedge, and roads. The site is approximately 9.1 metres above sea level and measures approximately 1,250.0 square metres. Soils on site are described as *loamy soils with naturally high groundwater*.

Existing Site Vegetation

- 2.2 The vegetation on-site is very limited due to the scale of the site. A well-maintained garden privet hedge (*Ligustrum ovalifolium*) of low value lines the north-eastern boundary. The southern corner of the site contains a semi-mature oak tree (*Quercus robur*) of moderate value. The south-eastern boundary is lined with 4 no. recently-planted ornamental cherry (*Prunus sp.*) trees of low value, and 2 no. conical box (*Buxus sempervirens*) shrubs of low value.

3.0 DEVELOPMENT PROPOSAL

- 3.1 The development proposals consist of the construction of 3 no. detached bungalows with associated hard surfaced access paths and hard surfaced parking. Each bungalow would be set within a soft landscape garden, with new planting proposed both within the gardens and to the property boundaries.

4.0 ARBORICULTURAL IMPACT ASSESSMENT

Effects of Development Proposals on Existing Vegetation

- 4.1 The impacts upon vegetation within the site would be very limited, due to the lack of trees on the site. No trees would require removal to accommodate the proposals.
- 4.2 The areas of parking space surrounding the moderate-value Oak tree (**T04**) encroach upon 8% of the overall area of the tree's RPA. In the absence of mitigation, the works are likely to cause a decline in the tree's vitality and condition, resulting in the potential failure of the tree in the future. To prevent this, 'no-dig' construction and operation zones are proposed to enable construction within the tree RPA. 'No dig' construction will be utilized within areas of the tree's RPA where a footpath is proposed, to avoid harm to existing roots and allow the continued exchange of air and water to the soil beneath. Tree surgery crown reduction works to the east and west of the tree would be undertaken to allow construction access to the site without causing damage to the tree canopy. A ground protection zone will be implemented under the tree canopy to enable construction access within the root protection area.
- 4.3 Two sheds are proposed on the edge of the nominal RPA of the low-value privet hedge. In the absence of mitigation these proposals may cause a decline in these sections of hedge and loss of continuous vegetation. The sheds shall be installed either on a surface-laid concrete slab or on paving slabs bedded on sand. The turf and loose soil only shall be removed to enable this.

4.4 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;***
- ***Removal of Existing Vegetation not for Retention;***
- ***Construction of New Dwellings; Construction of Hard Surfaces;***
- ***Ground Work / General Site Operations;***
- ***Implementation of Soft Landscape Planting and Fencing;***

Tree Retention, Protection and Removal

4.5 A small shrub group (**SH03**) are of low quality and their removal is recommended to accommodate site plan. The shrubs are very small and of no value to the site. All other trees and hedge are proposed to be retained and protected.

4.6 Where construction access is required over unmade ground within RPAs, the ground shall be protected within operation zones. The level of protection required shall be proportionate to the weight of traffic proposed to cross the ground. Construction of a footpath within the RPA of a moderate-value oak, and installation of sheds within the RPA of the low-value privet hedge would be enabled without harm to the moderate-value oak tree through use of 'no-dig' construction.

4.7 All trees; hedges; and shrubs proposed for retention shall be protected through the installation of Tree Protection Barriers. Where possible these shall protect the entire RPAs of trees. Where this is not possible for access reasons, the areas of soft ground within RPAs shall be protected within operation zones with appropriate ground protection measures.

4.8 The construction access shall utilize the existing access to the south-west of the site through Canal mews.

Impact of Loss of Existing Trees

4.9 The loss of vegetation on the site is minimal, with no boundary vegetation removal and no moderate or high-value trees proposed for removal. Only 2 no. small ornamental shrubs are proposed for removal. The impact upon visual amenity and ecology is considered to be '*negligible*'.

Tree Loss Mitigation Measures

- 4.10 The tree protection measures proposed would mitigate the impact upon tree roots of moderate and low-value trees and hedges. New tree planting is proposed within the proposed gardens; new native mixed-species hedges are proposed to the south of the site encompassing the existing tree line and are proposed to separate dwellings. These measures are considered to mitigate more than adequately for the loss of vegetation, and would result in a net gain in arboricultural; amenity; and ecological terms over the medium-long term.

5.0 ARBORICULTURAL METHOD STATEMENT

Protection and Retention of Existing Habitats – Scattered Trees / Shrubs Hedgerows

- 5.1 The Contractor shall exercise extreme 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. 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;*
- *Roots exceeding 25 mm in diameter must not be severed. 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 should take place outside the bird nesting season (nesting season: March-September inclusive) or alternatively under a watching brief from a suitability qualified ecologist.*

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

- 5.2 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. The compound shall be fenced (*2.0m minimum height Heras Weld Mesh Fencing*) and shall allow designated contractor access without obstruction for construction vehicles entering the site.
- 5.3 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.
- 5.4 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*.

Removal of Existing Vegetation

- 5.5 All existing trees to be designated for removal are to be removed in accordance with the *LLD1345-ARB-DWG-002 – 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.
- 5.6 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.

- 5.7 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.
- 5.8 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. The shrubs required for removal within the site are so small as to offer no bird nesting potential.

Tree Surgery

- 5.9 Tree surgery works are proposed and detailed within the *LLD1345-ARB-SCH-001 – Existing Tree Schedule*. 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

Tree and Vegetation Management

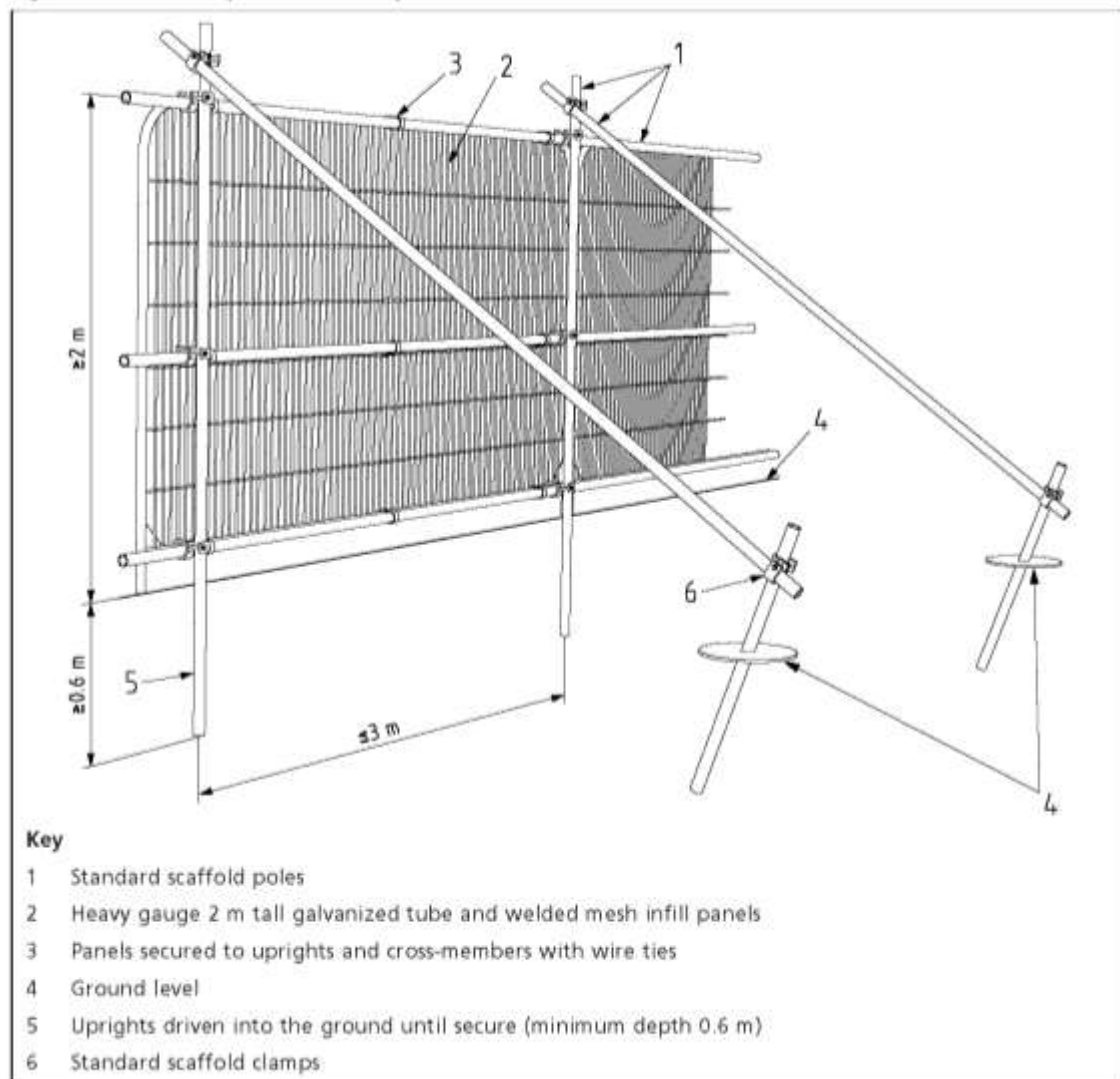
- 5.10 For Tree and Vegetation Retention and Removal Proposals refer to the accompanying *LLD1345-ARB-SCH-001 - Existing Tree Schedule*.

Protection and Retention of Existing Vegetation

- 5.11 The Contractor shall exercise extreme 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.
- 5.12 All excavations, cultivation and grading beneath the canopy of existing mature trees and within the specified Root Protection Areas of the existing trees and vegetation shall be carried out using hand tools, taking care not to damage or disturb any existing tree roots.

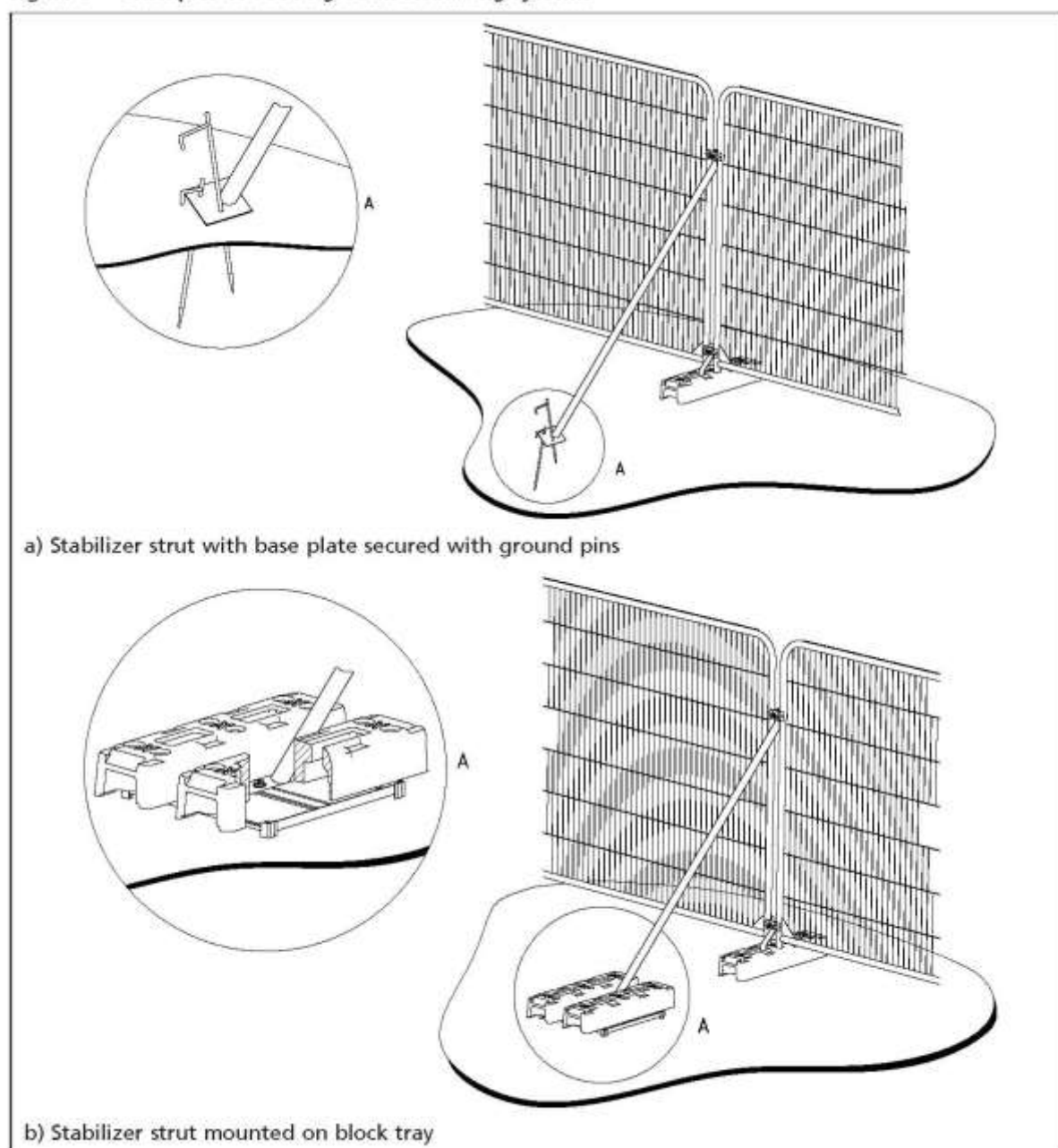
- 5.13 All trees to be retained on site shall be protected with Tree Protective Barriers, consisting of fencing erected around the area of mature vegetation in accordance with *BS 5837; 2012 'Trees in Relation to Design, Demolition and Construction - Recommendations'*. The fencing shall be installed, 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.
- 5.14 The installed protective barriers 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 fencing 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 drawing *LLD1345-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



- 5.15 Day-glo ribbons shall be maintained during the main works by the Main Contractor attached to the top of the fencing to ensure that the fencing is clearly visible during the works. The tree protection fencing shall display all-weather notices starting '*Construction Exclusion Zone – NO ACCESS*'.
- 5.16 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 Architect / Arboricultural Consultant.* Repositioning of the protective barriers during the course of the contract as the contract works progress shall need prior agreement with the Landscape Architect / Arboricultural Consultant.
- 5.17 Within the protected areas the following activities must not take place;
- ***No vehicles are to be used in the fenced off areas;***
 - ***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.***
- 5.18 Existing service runs should always be used wherever possible. Where the proposed routing of services impinges upon the root protection area of any existing tree to be retained, the routing shall be undertaken in accordance with a manual excavation method; to be carefully hand dug and routed most directly to and from the exterior of the tree root protection area radius. Services are to be trenched and routed together wherever possible to create the minimum impact upon the tree roots of the existing trees to be retained. Trench excavation across the tree root protection area radius beside an existing tree shall be avoided, whereby tree roots will become severed. Where services are to cross the edge of an existing tree root protection area, they should be routed through existing tree roots, via a hand dug ducting sleeve, avoiding damage to existing tree roots within the root protection zone.

5.19 Phasing of the construction works should be considered to minimise the requirement for ground protection and avoid vehicular movements over unmade ground.

5.20 Arboricultural supervision is recommended at the following stages of work;

- *Installation / checking of tree protection measures;*
- *Method statement briefing for site staff;*
- *Checking of ground protection measures prior to first use;*
- *Supervision of manual excavation;*
- *Specification and Installation of 'No-Dig' Construction;*
- *Removal of tree protection measures.*

Ground Protection Measures – Operation Zone During Construction

5.21 While construction work is commencing on the proposed highway access and pedestrian footpath within retained tree RPAs, the existing ground levels within the RPAs of trees to be retained are to be protected.

- *For pedestrian access only, protection should consist of a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (100 mm depth of woodchip), laid onto a geotextile membrane;*
- *For pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (150 mm depth of woodchip), laid onto a geotextile membrane should be used;*
- *For wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.*

- 5.22 The ground protection should be in place for the duration of the construction period in accordance with *BS 5837:2012 - 'Trees in Relation to Design, Demolition and Construction - Recommendations'*. When construction work is completed the ground protection can be removed.

Tree Protection Measures – No-Dig Construction

- 5.23 A 'no-dig' Construction method shall be employed during the construction of the highway access and pedestrian footpath within tree RPAs, in order to avoid damage to existing tree roots and localised compaction of subsoil within the tree root protection areas of trees proposed for retention.
- 5.24 Existing surfacing materials shall be left undisturbed and retained during the construction period for as long as possible in order to protect the tree root protection area of the existing trees to be retained; existing soft ground layers shall be removed carefully by hand within the existing tree root protection areas. A geo-textile filter membrane is to be laid over the existing ground (*Geotextile filter membrane to be TDP 115 Non-woven Geotextile Fabric or equal and approved.*) A ground stabilising geo-mesh (*'TDP SN20 GeoGrid' or equal and approved*), shall be rolled out over the geo-textile and evenly covered with a No Fines - Open Graded Aggregate (*in accordance with Highways Agency Specification; Clause 805 (Type 3) or equal and approved.*)
- 5.25 The granular fill for the pedestrian footpath shall be incorporated within a 3 dimensional GeoCell (*Terram Geocell 25/10 or equal and approved*) and shall ensure a minimum supportive construction depth of 100 mm for pedestrian traffic only.
- 5.26 A geo-textile filter membrane is to be laid over the granular fill construction (*Geotextile filter membrane to be TDP 115 Non-woven Geotextile Fabric or equal and approved.*) A permeable system and construction method shall be installed over the prepared sub-base layers. A bedding layer of crushed aggregate (*to BS EN13242; range size; 4 - 14 mm*) is to be laid level and compacted above the Geotextile filter membrane to a depth of 50 mm. A permeable top layer, which could consist of (*for example*) resin-bound gravel; or permeable block-paving shall then be installed above the bedding layer to create the terrace areas.
- 5.27 The sheds shall be installed either on a surface-laid concrete slab or on paving slabs bedded on sand. The turf and loose soil only shall be removed to enable this.

- 5.28 Any kerbs or edge restraints shall also be of 'no-dig' construction within RPAs; these shall be formed of pinned timber sleepers; or a standard kerb construction installed on top of the cellular layer.
- 5.29 The path and parking access shall be constructed prior to construction of the dwellings, such that this can then be used as construction access with the final wearing layer added once construction of the dwellings is complete.

Tree Protection Measures – Manual Excavation and Demolition of Existing Structures

- 5.30 All excavation-related operations within proximity of nearby trees (*including demolition of existing structures*) shall be executed with due care and attention using hand-held tools only, in order not to disturb exposed unmade ground and any existing tree roots present within it. Roots over 25mm diameter or those occurring in clumps must not be severed without Arboricultural advice. Roots below such size may 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.
- 5.31 When buildings are being demolished adjacent to existing trees, a "top down, pull back" method should be employed whereby demolition is undertaken inwards within the building footprint, in accordance with *BS 5837:2012 – 'Trees in Relation to Design, Demolition and Construction - Recommendations'*. Where existing building foundations or areas of hard standing exist within the root protection areas of existing trees; these hard surfaces shall be removed and excavated by manual methods and excavated back to the level of the base of the existing hard standing sub-base. The soiled root zone within the tree root protection areas of existing adjacent trees should remain unaffected, and further protected with tree root protection fencing.



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