

ANGEL & HYDE NURSERY, BARNHAM



JSL3362_770
Tree Survey, Arboricultural
Impact Assessment &
Method Statement
October 2020

TREE SURVEY, ARBORICULTURAL IMPACT ASSESSMENT & METHOD STATEMENT

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- Appendix A Tree Survey Schedule JSL3362_700A
- Appendix B Tree Constraints Plan JSL3362_700
- Appendix C Tree Protection and Removal Plan JSL3362_702A
- Appendix D Root Protection Area Fencing Details
- Appendix E Construction Exclusion Zone (CEZ) Signage

1 INTRODUCTION

- 1.1 This Tree Survey, Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) has been prepared by RPS on behalf of Redrow Homes to support the planning application for proposed development on land accessed from Yapton Road, Barnham, Bognor Regis.
- 1.2 A tree survey of the application area was carried out by RPS on 26th July 2019 in accordance with the requirements of BS5837:2012. Refer to Tree Constraints Plan JSL3362_700 (Appendix B). The weather was sunny with some cloud and a slight breeze.
- 1.3 This report has been prepared in broad accordance with the requirements set out in BS5837:2010 'Trees in relation to design, demolition and construction – Recommendations.'¹
- 1.4 The purpose of this report is to:
 - Provide an assessment of the quality of the surveyed trees with reference to the categories and sub-categories listed within Table 1 - BS5837:2012.
 - Assess and quantify the arboricultural impact of the proposed development within the survey area, based on the proposed development layout.
 - Provide additional arboricultural information and advice in relation to the protection of trees throughout the development of the site.
 - Advise on methods of construction / implementation within RPA of retained existing trees if necessary; and;
 - Provide a Tree Protection and Removal Plan to detail the proposed protective measures to be taken in respect of the trees during development of the site.
- 1.5 The Tree Protection and Removal Plan JSL3362_702A included at Appendix C identifies the following:
 - Trees to be retained;
 - Alignment and design of protective fence;
 - Root Protection Area (RPA) of trees;
 - Methods of construction / implementation within RPA of retained existing trees
- 1.6 The Arboricultural Method Statement should be made available to all relevant site operatives prior to and throughout the demolition and construction process, so they understand the scope and importance of the tree protection measures.
- 1.7 To minimise the potential for harm to occur to retained trees all works shall be carried out with regard to the Tree Protection Measures and construction techniques detailed within this report.
- 1.8 In particular the establishment of a Construction Exclusion Zone (CEZ) by erection of Tree Protection Fencing will minimise the potential for harm to occur to retained trees.

¹ British Standards Institute. British Standard (BS5837) Trees in Relation to Design, Demolition and Construction - Recommendations. 2012.

2 SITE LOCATION

- 2.1 The survey covered an area of land located south west of Yapton Road, Barnham. Barnham is a small rural village in the Arun District of West Sussex, England.
- 2.2 The site is accessible via Yapton Road.
- 2.3 The survey site is situated to the south of Barnham and compromises of an open field surrounded by well treed shelter belts on the western and southern boundaries that provide screening to the adjacent residential, pubic and commercial properties to the east, south and west.
- 2.4 The wider landscape is semi-rural with individual trees, small groups of trees and hedgerows alongside roads.
- 2.5 The soilscape of the area typically consists of 'Loamy soils with naturally high groundwater.'²

² *Magic.gov.uk – 28.06.2020*

3 SURVEY METHOLDODOGY

- 3.1 This report has been authored by Stefan Kowalczyk, Senior Consultant Arborist (Dip.Arb L4, TechArborA) of RPS and authorised by David Cox, a professional member of the Arboricultural Association and Chartered Landscape Architect of RPS Group.
- 3.2 The tree survey was undertaken by Stefan Kowalczyk, Senior Consultant Arborist (Dip.Arb L4, TechArborA) of RPS.
- 3.3 The report and survey were carried out in general accordance with the requirements set out in BS 5837:2012 "Trees in Relation to Design, Demolition and Construction – Recommendations".
- 3.4 The tree survey involved a visual inspection from the ground of individual specimens and groups of trees to record their amenity value, management recommendation and dimensions. Where observed, the general condition of all the trees has been noted. The survey does not constitute a full arboricultural condition assessment involving the detailed inspection of tree in relation to their structural condition, decay, and any other physical and pathogenic defects. A full post development tree inspection is recommended to establish that the trees retained during construction pose acceptable levels of risk once the development has been completed.
- 3.5 Trees were not climbed or inspected below ground level and inaccessible trees will have best estimates made about the location, physical dimension and characteristics.
- 3.6 The location of the trees is based on a topographic survey (Ref. 27295) produced by MK Surveys in July 2019.
- 3.7 The survey assesses individual trees and groups of trees for quality and benefits within the contents of proposed development. The quality of each tree or group of trees has been recorded by allocating it to one of four categories as described in table 3.1. These categories have been differentiated on the Tree Constraints Plan JSL3362_700 (Appendix B) by colours.
- 3.8 The survey information was recorded on the attached Tree Survey Schedule (Appendix A) in general accordance with the guidance contained within Section 4 of BS 5837:2012 "Trees in Relation to Design, Demolition and Construction – Recommendations".
- 3.9 The information recorded is detailed in Table 1.

Table 1 Tree characteristics recorded during survey

Tree Ref No:	Sequential reference number of trees or groups of trees. Avenues, woodlands and hedgerows were also recorded on the tree survey plan. # - denotes inaccessible trees (best estimates are made about the location, physical dimensions and characteristics.)			
Species	Species listed by common name, with scientific names (italic lettering).			
Height (m)	Estimated height of canopy to nearest metre.			
Branch Spread	branch spread, taken as a minimum at the four cardinal points, to derive an accurate representation of the crown			
Stem diameter @ 1.5 m (m)	Estimated diameter of trunk at 1.5 m above ground level in metres unless otherwise indicated, multi-stemmed trees being measured in accordance with Annex C: BS5837			
Existing height above ground level	To inform on ground clearance, crown/stem ratio and shading the estimated height of the first significant branch and direction of growth and canopy above ground level.			
Stem No.	Number of stems (if necessary) of individual tree.			
Life Stage	Expressed as:-	Y SM EM M	(Young) (Semi-mature) (Early-mature) (Mature)	OM V D (Over-mature) (Veteran) (Dead)
Physical Condition	Apparent condition expressed as the following categories, based upon a brief visual inspection from the ground only:-	Good Fair Poor Dead		
Comments / Management Recommendations	General observations, particularly of structural and/or physiological condition (e.g. the presence of any decay and physical defect), and/or preliminary management recommendations and potential for wildlife habitats (not exhaustive).			
Estimated remaining contribution (years)	Estimated remaining contribution, in years (<10, 10+,20+,40+)			
Tree Quality Assessment Value: <u>Category</u>	Criteria grading with regards to Table 1: BS 5837:2012, expressed as:-	A (Trees/Vegetation of high quality and value) B (Vegetation of moderate quality and value) C (Trees/Vegetation of low quality and value) U* (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)		
	* Category U trees can have existing or potential conservation value which might be desirable to preserve.			
Tree Quality Assessment Value: <u>Sub - Category</u>	Criteria grading with regards to Table 1: BS 5837:2012, expressed as:-	1 (Trees with mainly <i>arboricultural</i> value) 2 (Trees with mainly <i>landscape</i> value) 3 (Trees with mainly <i>cultural / conservation</i> value)		

Limitations

- 3.10 The findings of this survey are not valid following adverse or unpredictable weather conditions or for any failure due to 'force majeure' or unpredictable events.
- 3.11 The survey does not constitute a full arboricultural condition assessment involving the detailed inspection of trees in relation to their structural condition, decay, and any other physical and pathogenic defects. It is recommended that further arboricultural assessments be undertaken in order to assess the full health and safety of all trees which may possess structural or pathogenic conditions.
- 3.12 Trees were not climbed or inspected below ground level and inaccessible trees will have best estimates made about the location, physical dimensions and characteristics.
- 3.13 Where direct access to trees was difficult or not possible a '#' denotes this within the Tree Survey Schedule JSL3362_750, Appendix A.
- 3.14 Where the locations of trees were not highlighted in the provided topographical survey – 27295 by MK Surveys, they were estimated on site and highlighted within the supporting plan/s with a star - *.
- 3.15 Trees and woody vegetation were not assessed for their potential impact upon future construction issues such as foundation designs (re: NHBC chapter 4.2)³. Whilst this report may assist in assessing likely future impacts, it should not be classed as a comprehensive vegetation survey in relation to impact upon future designs.
- 3.16 Trees are dynamic, living organisms and respond rapidly to changes in their environment. The tree conditions cannot be assumed to remain unchanged.
- 3.17 Newly planted crops in the fields limited access to public rights of way only. Trees along the East and Western boundaries were viewed from site side only or were assessed from distance where they are located on private property.

³ NHBC. 'Chapter 4.2- Building Near Trees'. NHBC Standards 2016.

4 APPRAISAL AND RECOMMENDATIONS

Generally

- 4.1 There were variations in the structural condition of the trees and hedges surveyed however in the main, individual condition is largely consistent with expectation for the age, management and species.
- 4.2 The surveyed trees and tree groups consists of mainly of English oak (*Quercus robur*), Sycamore (*Acer pseudoplatanus*), and Aspen (*Populus tremula*). These provide amenity and partial screening to the adjacent properties and sections of private and public land.

Surveyed Trees

- 4.3 The site is currently an unused field with shelterbelt trees along the western and southern boundary and a mixture of trees in adjacent residential properties.
- 4.4 The most significant trees surveyed are in the north west corner (T2 – T5) and west of the site (T11 & T12), all of which are protected by a Tree Preservation Order (TPO) enforced by Arun District Council. The trees were noted to be predominantly mature and in good condition.
- 4.5 Within the south west corner is a small group of large Aspen trees that provided good shelter between the site and adjoining public open space to the west.
- 4.6 The southern boundary is populated with a shelterbelt of large mature tress (G5 – G7) between 10-15m tall providing a valuable landscape feature to the site.
- 4.7 G8 is a large area of coppiced Aspen in the middle of the site that provides little benefit to the site in general. The re-growth from the coppice heads (common for coppices) is becoming established.

Planning considerations

- 4.8 The Arun District Council website confirmed that there are Tree Preservation Orders currently in place (reference TPO/BN/1/10), covering the majority of trees within the north west corner of the site.
- 4.9 Trees covered by a Tree Preservation Order are protected under the Town and Country Planning Act 1990 (Trees Regulation 2012) and the local authority must be consulted, and permission sought for any works that may affect them.
- 4.10 The site is not within the Conservation Area.
- 4.11 Ancient woodlands: A desktop investigation using the Magic Maps application² confirmed that there are no ancient woodlands within or bordering the survey site.
- 4.12 The Hedgerows Regulations 1997 were made under Section 97 of the Environmental Act 1995 and came into operation in England and Wales on 1 June 1997. The regulations provide important protection by prohibiting the removal of most countryside hedgerows (or parts of them) without first notifying the local planning authority (LPA). Removal includes acts which could result in the destruction of a hedgerow.
- 4.13 Care is needed regarding the retention of large, mature trees which become enclosed within the new development, such as T2 – T5, T11 and T12. Where such trees are retained, adequate space should be allowed for their long-term physical retention and future maintenance.

- 4.14 Under the UK planning system, local authorities have a statutory duty to consider the protection and planting of trees when granting planning permission for proposed development. The potential effect of development on trees, whether statutorily protected (e.g. by a tree preservation order or by their inclusion within a conservation area) or not, is a material consideration that is taken into account in dealing with planning applications.
- 4.15 Regarding a particularly valuable tree with serious structural faults it may be decided it be retained and the proximity of the target to the tree be reduced. This could be achieved by retaining or encouraging the formation of physical barriers (e.g. dense bramble or Holly understory) to deter direct access.
- 4.16 Particular care is needed regarding the retention of large, mature trees which become enclosed within the new development. Where such trees are retained, adequate space should be allowed for their long-term physical retention and future maintenance.
- 4.17 Trees can offer many benefits, including the provision of visual amenity, softening or complementing the effect of the built environment, and adding maturity to new developments by making places more comfortable in tangible ways e.g. contributing screening and shade, reducing wind speed and turbulence, intercepting snow and rainfall, and reducing glare.
- 4.18 Existing trees on development sites, if included into plan, can offer many benefits, including the provision of visual amenity, softening or complementing the effect of the built environment, and adding maturity and value to new developments.
- 4.19 New tree planting opportunities should be considered as part of any potential redevelopment, this will help to broaden the age diversity of the tree cover within the area. Enough space should be provided for species with significant stature to grow out into maturity.
- 4.20 Trees may have the potential to provide valuable habitat for significant and/or/ protected species. It is therefore recommended that this report is read in conjunction with the ecology surveys for the site.

Design and Site Layout Considerations

- 4.21 A tree constraints plan defines the Root Protection Area (RPA) for each tree shown as a circle. This area may be adjusted should physical constraints or topographical features limit root activity in a particular area, however the total area should remain the same. Prior to any adjustment of the trees RPA zones the changes should be assessed by an arboriculturalist. During any site planning exercises the current and future growth potential of the trees should be considered.
- 4.22 The RPA for single stem trees broadly equates to a radius 12 times the stem diameter of the tree at 1.5m above ground level or the extent of canopy spread, whichever is the greater. For multi-stemmed, low branching trees or those with trunks with an irregular girth the point of stem diameter measurement is adjusted in consideration of these factors and in accordance with the illustrations in BS5837:2012 (Annex C).
- 4.23 The RPA should become an exclusion zone during construction works and for any development. It should be fenced-off and protected in accordance with BS5837:2012. The canopy is likewise susceptible to damage during construction work and requires similar protection.
- 4.24 No activities that result in excavations, changes in level or soil compaction should take place within the RPA of any retained trees, especially older mature trees. This would include the storage of materials, any construction work, trafficking by vehicles or even excessive trafficking by pedestrians.

- 4.25 If some form of construction has to take place within the RPA, then certain measures need to be adopted to avoid disturbance or damage to the roots and to maintain moisture infiltration and gaseous diffusion into the soil.
- 4.26 Services likewise should be routed outside the existing or potential root zone of trees. Where it is unavoidable, then certain measures should be employed to avoid damage to the tree's larger roots.
- 4.27 The location and siting of new facilities near trees should consider the potential impact on and conflict with both tree roots and canopy. This should consider the ultimate size of existing young and middle-aged trees at maturity. Conversely the impact of the tree on the activities should also be considered with regard to obstruction, shading, leaf fall and root action. These are problems that can be managed provided sufficient space is allowed for.

Services

- 4.1 Services likewise should be routed outside the existing or potential root zone of trees. Where it is unavoidable, then certain measures should be employed to avoid damage to the tree's larger roots.
- 4.2 The location and siting of new facilities near trees should consider the potential impact on and conflict with both tree roots and canopy. This should take into account the ultimate size of existing young and middle-aged trees at maturity. Conversely the impact of the tree on the activities should also be considered with regard to obstruction, shading, leaf fall and root action. These are problems that can be managed provided sufficient space is allowed for.
- 4.3 Any new services should avoid the RPAs of any retained tree. Where it is unavoidable, then the route of the services must be designed by an Engineer in consultation with an Arboriculturalist.
- 4.4 Further advice can be found in NJUG Volume 4- "Guidance for the planning, installation and maintenance of utility services in proximity of trees".

Trees and Management of Health and Safety

- 4.5 It is recommended that a programme of periodic arboricultural assessments be undertaken in order to regularly assess the full health and safety of all trees both in full leaf and bare stemmed. The assessments should prioritize areas based on levels of access and presence of target (i.e. exposure of people to hazard) and accord with arboricultural advice, taking account of relevant factors (where known) that affect safety such as the age class, condition, size and species of the trees.

5 ARBORICULTURAL IMPACT ASSESSMENT

Introduction

- 5.1 Trees have finite energy reserves, developed each year throughout the growing season, which are utilised for biological processes such as growth and defence against pests or diseases throughout the following year.
- 5.2 Any development in proximity to trees has the potential to cause harm to those trees unless control measures are identified and acted upon; as such it is essential to consider the relationship between the proposed development and the retained trees to identify what precautions are necessary, proportionate and appropriate.
- 5.3 Damage that is not immediately evident, but which can cause long term harm to retained trees includes things such as damage to the soil structure by compaction causing root damage and levels changes altering the water table and affecting moisture availability.
- 5.4 To minimise the potential for harm to occur to retained trees all works must be carried out with regard to the Tree Protection measures detailed within this report.
- 5.5 In general, it can be seen that, by adopting appropriate methods of working, precautionary and protective measures, significant harm to retained trees can be avoided.
- 5.6 In particular the establishment of a Construction Exclusion Zone (CEZ) by erection of Tree Protection Fencing will minimise the potential for harm to occur to retained trees.
- 5.7 The retention and protection of significant trees and vegetation will assist in assimilating the proposed development into the wider landscape and offer long term tree cover.
- 5.8 Furthermore, redevelopment of the site may offer an excellent opportunity to actively manage any retained vegetation and accordingly we recommend restorative tree works be undertaken as appropriate. This will further improve the amenity value and landscape setting of the site and increase the useful life of any retained trees.

Brief Description of Proposed Development

- 5.9 This report relates to the following:
 - New residential estate; and,
 - Associated works.

Retained Trees

- 5.10 This development seeks to retain all trees where practical both in consideration of tree health and the facilitation of the development proposals.
- 5.11 The most significant retained trees are located within the middle of site and along the western and southern boundaries. These trees provide significant amenity and ecological benefit to the surrounding area and have been incorporated into the design and layout of the scheme to ensure their long-term retention. Hard and soft landscaping around the residential units will incorporate existing trees as valuable features within minimal impact to tree health.
- 5.12 Detailed Tree Protection Plans JSL3362_702A have been prepared for the construction phase of the works and included within this report at Appendix C.

Proposed works within the Root Protection Area (RPA)

- 5.13 Root Protection Areas for each tree, group of trees and hedgerows surveyed have been determined in accordance with BS5837:2012⁴.
- 5.14 It is anticipated that ground works will be required within the RPA of retained trees on this site. Namely the RPAs of; **T2, T3, T4, T5, T6, T8, T11, T12, T19, T20, T21, T22, G5, and G6**. These works will, on the whole, change the structure within the RPAs – soft landscaping into hard landscaping.
- 5.15 Due to the close proximity and shared root space of **T2, T3, T4, T5 & T6** it is likely that root grafting between trees will have occurred. The total area of RPA has therefore been added together to form one large area for the purpose of the incursion calculations. The total RPA area for **T2, T3, T4, T5 & T6** is 1,264 square metres (sqm).
- 5.16 The same method for calculating the impact has been applied to **T19, T20, T21 & T22** which share the same root space. The total area of which is – 750 sqm.
- 5.17 In relation to **T12 & T11**, Impact is only proposed within the RPA of **T12** Therefore this has been addressed by an individual RPA rather than share rooting area with the adjacent - **T11**.
- 5.18 Additionally, Impact to **T8, T9 & T10** is proposed due to the proposed construction of residential garages.

Table 2: Detailed analysis of impact on RPAs

Tree No.	RPA (sqm)	Proposed Incursion (sqm / %)	Impact with RPA/canopy	Allowed construction exclusion zone (sqm / %)
T2, T3, T4, T5, T6	1264	227 / 18%	Installation of above ground access road	15%
			Installation of footpath and car parking space	3%
				1253 / 99% of a non circular RPA
T8	150	20 / 13%	Excavation to be completed by hand and roots, if encountered, pruned in accordance with BS3998:2010.	N/A section of RPA offsite
T9 & T10	83	9 / 11%	Excavation to be completed by hand and roots, if encountered, pruned in accordance with BS3998:2010.	N/A section of RPA offsite
T12	220	25 / 11%	Ground protection suitable for foot traffic throughout construction phase. To be finished with soft landscaping and small section of hard standing.	348 / 158%
T19,T20, T21, T22 & G4	750	64 / 9%	Installation of above ground footpath to provide in link to public open space to the west. Removal of small trees/undergrowth	N/A section of RPA offsite
Continued over page...				

⁴ BS5837: 2012 'Trees in relation to design, demolition and construction – Recommendations'.

G2	261	17 / 7%	Excavation to be completed by hand and roots, if encountered, pruned in accordance with BS3998:2010.	N/A section of RPA offsite
G5	Large group RPA	75	Excavation / grading down away from tree stem into attenuation basin. Completed under watching brief.	N/A section of RPA offsite
G6	Large group RPA	92	Excavation / grading down away from tree stem into attenuation basin. Completed under watching brief.	N/A section of RPA offsite

Impact to tree canopy

T12, English Oak

- 5.19 It is anticipated that the western extent of T12 may have to be reduced by a maximum of 2m to allow sufficient room for the construction of plot 83 & 84. The proposed works, if required, will be minor and applied only to lateral branches that are likely to come into contact with scaffolding.
- 5.20 **Specification of works – T12, English Oak** - Reduce lateral branches on the western extent of canopy by no more than 2m by removing tertiary branches only. All works to be completed by a suitable certificated Tree Surgeon.

G6, Mixed species group

- 5.21 Similarly, the northern canopy extent of G6 may require a lateral branch reduction of up 2m to allow sufficient room for the construction of the block of flats in the south easterly corner.
- 5.22 **Specification of works – G6** – Reduce lateral limbs in association with proposed build/scaffolding by up to 2m. All works to be completed by a suitable certificated Tree Surgeon.

Analysis of RPA incursion compared with previous layouts

- 5.23 Relevant planning reference numbers
- a) BN/29/13 86 RM and
 - b) BN42/18/PL s73
 - c) P19-0723 10H (**Current**)
- 5.24 The following table (over page) makes comparison between previous layouts. The findings of which study highlights the significant improvements on previous scheme to ensure that adverse impact to trees and their associated RPAs is kept to a minimum.

Table 3: Analysis of impact on RPAs when compared with previous layouts

Tree No.	Work Activity	Total RPA (sqm)	Impact BN/29/13 86 RM (sqm/%)	Impact BN42/18/PL s73 (sqm/%)	Impact P19-0723 10H (Current) (sqm/%)
T2, T3, T4, T5, T6	Instillation of low impact access road (Marked in red hatching in the Tree Protection & Removal Plan)	1,260	413 / 33%	376 / 30%	227 / 18%
T12	Instillation of low impact paving slabs to serve front entrance and front garden area (Marked in green hatching in the Tree Protection & Removal Plan)	222	17 / 8%	80 / 36%	26 / 12%

6 TREE REMOVALS AND PROTECTION MEASURES

Root Protection Areas

- 6.1 Root Protection Areas (RPA) for each tree and group of trees surveyed has been determined in accordance with section 4.6 of BS5837:2012.
- 6.2 Root Protection Areas for the surveyed trees have been plotted onto the Tree Protection and Removal Plan with the tree located centrally, extending to encompass the area of ground, and thus the minimum rootable soil volume, required for protection.
- 6.3 In some cases, where rooting is likely to have occurred asymmetrically, the relevant proportion of the RPA has been highlighted to show where existing built structure or hardstanding is within the RPA. Section 4.6.2 of BS5837:2012 states that;
- “Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the area of the RPA should reflect a soundly based arboricultural assessment of likely root distribution.”
- 6.4 Irrespective of eventual shape, the RPA should become an exclusion zone during construction works and for any development. It should be fenced-off and protected in accordance with BS5837:2012. The canopy is likewise susceptible to damage during construction work and requires similar protection.

Construction Exclusion Zone

- 6.5 The Construction Exclusion Zone (CEZ) as defined by the protective fence line shall be regarded as sacrosanct, and the protective fencing shall not be moved or taken down at any time.
- 6.6 Within the CEZ there must be;
- **No** mechanical digging or scraping,
 - **No** storage of plant, equipment or materials,
 - **No** vehicular access,
 - **No** fire lighting,
 - **No** alteration to existing ground levels including soil stripping,
 - **No** handling or discharge of any chemical substance, concrete washings or of any fuels.
 - **No** earthworks.
- 6.7 Additionally, no materials that may contaminate the soil such as concrete mixings, diesel oil and vehicle washings shall be discharged within 10m of the stem of any tree and no fires shall be lit within 10m of the maximum extent of a tree's crown.

Tree Protection Fencing

- 6.8 Prior to the commencement of any site works the protective fencing is to be erected in accordance with the locations set out in the Tree Protection and Removal Plan JSL3362_702A.
- 6.9 Once the protective fencing is in place it must remain *in situ* throughout the course of construction until completion.

- 6.10 Copies of the Tree Protection and Removal Plan JSL3362_702A and this Method Statement shall be placed in the site office for reference by all site staff.
- 6.11 The Tree Protection Fence will be constructed using the heras 151 steadfast system. The system is a series of linked fence panels supported by concrete block feet. The panels will be secured to each other using at least two heraslock anti-tamper couplers, installed so that they can only be removed from inside the fence, and diagonal bracing of the structure would be achieved through the use of the heras steadfast strut secured using ground pins so that it is compliant with the guidance detailed within BS5387:2012 at 6.2.2.3.
- 6.12 Further details of the proposed fencing system to be utilised are shown within the attached Appendix D.
- 6.13 Signs detailing the purpose of the protective fencing shall be attached to the fencing at 10m intervals.
- 6.14 Following erection of the protective fencing and prior to commencement of construction it is recommended that an inspection of the site, by the appointed Arboricultural Consultant or Site Manager, is completed to confirm fencing has been installed in accordance with the Tree Protection and Removal Plans JSL3362_702A.

Retained Trees

- 6.15 The large majority of onsite trees are to be retained with some minor pruning works to be completed to reduce overhanging and potential conflict with construction.

T12, Oak

- 6.16 **Specification of works: T12. English Oak** - Reduce lateral branches on the western extent of canopy by no more than 2m by removing tertiary branches only. All works to be completed by a suitable certificated Tree Surgeon.

G6, Mixed species group

- 6.17 **Specification of works: G6** – Reduce lateral limbs in association with proposed build/scaffolding by up to 2m. All works to be completed by a suitable certificated Tree Surgeon.

Tree Removal

G4 – Mixed species group growing as understory

- 6.18 Some small tree removal G4 is proposed beneath the canopies of T19, T20, T21 & T22 in order to facilitate the construction of a pedestrian walkway.

G8 – Aspen coppice

- 6.19 Removal of small area of coppice Aspen required for the implementation of construction.

Ground protection

- 6.20 In addition to the erection of protective fencing ground protection measures shall be installed.
- 6.21 Ground protection measures shall be installed where access is required in the RPA where exposed soil exists.

- 6.22 Temporary ground protection on exposed ground shall be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil – **T11, T12, G6 & G7**. The ground protection to be installed shall be to the following specification;
- 6.23 “for pedestrian-operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150mm depth of woodchip), laid onto a geotextile membrane;⁵
- 6.24 If in the unlikely event that traffic exceeding 2t gross weight is required within the RPA of **T11, T12, G6 & G7** then the follow specification shall be applied;
- 6.25 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.¹
- 6.26 The primary aim shall be to avoid the compaction of soil within the RPA so that roots are not damaged so far as that they cannot function as they normally would.

Proposed works within the Canopy Spread

- 6.27 In some cases there is a potential for direct damage from the enabling works to allow for the build, in terms of access, health and safety of operatives and site security.
- 6.28 Lateral branch reduction works of the westerly and north westerly section of canopy of **T12** is required to manage overhanging branches and facilitate the construction of a proposed dwelling. The works will require the removal of no more than 2m of lateral growth.
- 6.29 Lateral branch reduction works of the northern section of canopy of **G6** may be required to manage overhanging branches and facilitate the construction of a proposed block of flats. The works will require the removal of no more than 2m of lateral growth.
- 6.30 It is not anticipated that any other trees on site will require pruning and therefore it has not been specified in the works schedule. If, however, areas of conflict do present themselves throughout the construction phase or, prior to work commencing on site, the appointed arboricultural representative must first be engaged before proceeding with any tree pruning works outside of the scope above.
- 6.31 Any required tree work shall be carried out by a suitably tree qualified tree surgeon, preferably an Arboricultural Association approved contractor in accordance with Arboricultural Association Standard Conditions of Contract and Specifications for Tree Works (2008) Edition and BS 3998:2010 Tree Work.

Installation of New Surfacing in Root Protection Areas (RPAs)

- 6.32 Table 2 highlights trees are group that will require an upgraded surfacing to be installed within their RPA. The Tree Removal and Protection Plan JSL3362_702A shows the minimum extent to ‘low invasive’ type surfacing required to successfully retain these trees. This is based on the BS5837(2012) derived RPA.

⁵ BS5837:2012. Trees in Relation to design, demolition and construction

Three-Dimensional Cellular Confinement System

- 6.33 The use of 3D cellular confinement system is suggested in BS5837(2012) as one appropriate way to achieve hard surfacing over tree roots, the following guidance is based on this principle.
- 6.34 For these areas a 3D cellular confinement system such as Cellweb will be installed to manufactures specification to ensure that soil compaction within the RPA is dissipated.

Installation

- 6.35 In order to attain a flat surface, it will be necessary to remove the top layer of earth by no more than 50mm using hand tools only. If, machinery is to be used, any machine must be either outside of an RPA or, situated on top of suitable ground protection.
- 6.36 If any additional excavation of ground level is required, it shall be assessed by the project Arboricultural Consultant.
- 6.37 A bedding layer of sharp sand can be laid on top of the existing surface to attain a level surface. No further excavation shall occur above the 50mm stated above.
- 6.38 Once a reasonable ground level has been achieved a layer of geotextile (e.g. Terram 2000 or Treetex) will be laid over the ground.
- 6.39 A 3D cellular confinement system such as Cellweb can then be laid out and pegged in place. The cellular confinement system will be filled with clean angular 4/20 stone (no fines).
- 6.40 Filling of the confinement system shall take place from outside of the RPA or, from already filled compartments.
- 6.41 Banked topsoil will be used to grade down from either side of the confinement system to existing soil level. Where proposed private footpaths are proposed, they shall match the proposed finish level of the confinement system.
- 6.42 Although not essential, a final wearing course can be added however, any final wearing course must be permeable.

Paving slabs / block pavers for dwelling access paths

- 6.43 Paving slabs and/or block pavers are to be installed with built in infiltration spaces between the slabs or block. They shall be laid dry-jointed onto a sharp sand or coarse aggregate, no fines foundation.

Detailed specifications

- 6.44 Final specification shall be prepared by the project engineer and based on manufacturers specifications for special surfacing. Any deviation from the above methodology shall first be considered by the project Arboricultural Consultant.

Excavation within RPAs

- 6.45 Where excavation within an RPA is required, for example within the RPA of **G5 & G6**, it shall be completed under the supervision of the appointed project arboriculturist. If any roots smaller than 25mm in diameter are found, they will be severed using secateurs, and not be ripped or torn.

- 6.46 If roots over 25mm are found the appointed project arboriculturist will make a decision as to whether they can be pruned or whether they must remain in order to support the structural integrity of the subject trees.

Installation of posts for fencing and/or signage

- 6.47 Posts wherever possible shall be driven into the ground avoiding any obvious large surface roots. If it is not possible to drive post into the ground, small holes can be excavated using hand tools only, avoiding roots, back filled with removed earth and compacted down to ensure stability.
- 6.48 If cement is required to provide reinforcement, the hole shall be dug using hand tools only, lined with a non-permeable layer and cement poured into the hole to ensure the leaching of chemicals into the RPA does not occur.

Dust Management

- 6.49 On particularly hot, dry weather conditions the dust created from the construction of built structures can cover tree canopies and subsequently cause indirect damage to trees by reducing transpiration through the leaves and their ability to photosynthesise.
- 6.50 On all occasions when dust settles on tree canopies a water hose shall be used to water down and remove all dust from leaves within the canopy.

Site Compounds and Materials Stores

- 6.51 Activities related to the establishment of a temporary site compound have the potential to impact upon retained trees by various means. In particular, the storage and mixing of chemicals and materials such as concrete can have a damaging effect on tree health if precautions are not taken.
- 6.52 To prevent harm occurring to trees provision for materials storage, deliveries and other related activities shall be made available in areas away from retained trees.

Installation of Underground Services

- 6.53 Every effort has been made to ensure the routing of services does not interfere with RPAs. In the case that installation of services or the excavation of existing services is required within RPAs then the project Arboricultural Consultant must be present as part of a watching brief to be agreed with the client and contractor.
- 6.54 Trenching for the installation of underground services has the potential cause significant harm to trees by severing roots and/or change the hydrology of the soil. This can negatively impact the health and structural integrity of the tree.
- 6.55 It is essential that reference is made to National Joint Utilities Group Volume 4 (Formerly NJUG 10) for guidance. Consultation with the project Arboricultural Consultant during plan development and possible excavation is essential for limiting negative impact to trees.
- 6.56 Any required excavation within RPAs will be excavated using hand tools only and/or such soil displacement solutions such as an Air Spade and will be overseen by an appointed Arboricultural Consultant.
- 6.57 The excavation, instillation and backfilling of any trenches should be completed within the same day. Where this is not possible, where significant roots are exposed during the displacement of soil and are to be left exposed for a number of days, the roots shall be wrapped in wetted hessian and

the trench sides covered with a non-permeable membrane to avoid desiccation of the immediate soil.

- 6.58 Any roots smaller than 25mm in diameter will be severed using secateurs, they must not be ripped or torn.

Monitoring

- 6.59 It is recommended that the project Arboricultural Consultant be appointed to oversee tree protection measures for the duration of the construction and landscaping phases. Monitoring visits can be undertaken at key stages. For example;
- Instillation of new surfacing where it is within and RPA,
 - Any excavation within RPAs including;
 - The excavation and instillation of any services where they are within an RPA.

Reporting

- 6.60 Should any arboricultural issues become apparent during the works the site manager should immediately contact the appointed Arboricultural Consultant to provide advice upon how to proceed.

7 ARBORICULTURAL CHECKLIST

	Work Activity	Schedule of Works	Refer	Recommendations
General site works and tree related operations				
01	Tree works/removals	Complete approved tree works detailed within the AIA/AMS in association with the Tree Protection and Removal Plan and Tree Survey schedules	Please refer to the Tree Protection Plan and removal plan JSL3362_702A, Appendix C and details and Tree Survey Schedule JSL3362_700A, Appendix A.	None
02	Protect trees to be retained	The permanent site fencing shall remain intact, rigid and complete.	Tree Protection Plan and removal plan JSL3362_702A, Appendix C	Ongoing monitoring by appointed site manager and/or arboricultural Consultant
03	Install ground protection	Ground protection to be installed as highlighted in green on the Tree Protection and Removal Plan	Tree Protection Plan and removal plan JSL3362_702A, Appendix C	
04	Pre-start site	Pre-start site meeting to ensure that the scope of works is agreed with, site manager, client representative and arboriculture consultant and to ensure alignment of protective fence as agreed with the Client and any other protective measures.	Tree Protection Plan and removal plan JSL3362_702A, Appendix C	
05	Maintain the site (protective) fencing	Site manager to ensure the site protective fencing and other protective measures are maintained throughout the entire construction period and record any breach of the tree protection.	Tree Protection Plan and removal plan JSL3362_702A, Appendix C	Appointed responsible person.
Specific tree and construction works				
06	Works within the Root Protection Area (RPA)	All proposed surfaces within RPA areas shall be completed in a 'no dig' style, where existing soil levels	BS 5837:2012 Trees in relation to design, demolition and construction: Section 7	Engagement of a engineer will be required

	Work Activity	Schedule of Works	Refer	Recommendations
	New surfacing works	are only lowered by a maximum of 50mm by using hand tools only. New surfacing works shall look to reuse existing hard surfaces and their sub-base layers within the new construction. Where existing surfaces do not exist the use of suitable permeable, load distribution systems shall be employed.	Tree Protection Plan and removal plan JSL3362_702A, Appendix C	
07	Installation of fence posts and/or signposts	Where holes are to be excavated, they shall be excavated using hand tools only. Where fence and/or signposts are to be driven into to the ground a 1m degree of location leniency shall be adopted to ensure that significant roots are avoided. Where significant roots are encountered the hole shall be moved to avoid root damage. Where cement is to be poured in order to set a post, the hole in which it is poured shall be lined with a non-permeable membrane to ensure no leaching of chemicals occurs.		
08	Soft landscape works within the Root Protection Area (RPA)	Heavy mechanical soil cultivation techniques are not to be carried out within the RPA. Any cultivation shall be carried out by hand or pedestrian controlled light machinery to minimise damage to tree roots. Existing ground levels within the RPA shall be maintained.	BS 5837:2012 Trees in relation to design, demolition and construction: Section 8 Tree Protection Plan and removal plan JSL3362_702A, Appendix C	
09	Excavation within RPAs	1) Excavation for the construction of garages to be completed by hand 2) Excavation for the construction of the attenuation basin to be completed under Arboricultural supervision when within RPAs	BS 5837:2012 Trees in relation to design, demolition and construction: Section 8 Tree Protection Plan and removal plan JSL3362_702A, Appendix C BS 3998: 2010 Tree Pruning	

APPENDICES



Appendix A

Tree Survey Schedule JSL3362_700A

TREE SURVEY SCHEDULE

Site:
Project Schedule Ref:
Drawing Reference:
Survey date:

Angels Nursery, Barnham, Bognor Regis
JSL3362_750A
JSL3362_700
26/07/2019

Surveyor: Stefan Kowalczyk
Status: For Planning
Revision: A
Notes: Stem dia. (mm) for trees with 6 or more stems are estimated averages.



Ref. no	Species	Height (m)	Crown spread (m)				Stem dia. (mm)	Stem no. at 1.5m	Height of crown clearance (m)	Dir/height	Age class	Structural Condition	Physiological Condition	General Observations Management Recommendations	Estimated remaining contribution (yrs)	Tree Quality Category (BS3837)
			N	S	E	W										
T2	Populus tremula - Aspen	20	10	2	10	7	1500	1	5	North	M	Fair	Good	Located on end of visually significant group, suppressed form from south, multi stemmed at 3m above ground level, ivy in canopy	40+	B2
T3	Populus tremula - Aspen	20	5	3	10	8	500, 500	2	3	West	M	Fair	Good	Tree within visually significant group, suppressed form from south and north, twin stemmed at 1.5m above ground level. Integral tree to the group.	40+	B2
T4	Populus tremula - Aspen	20	4	10	10	8	1500	1	1	South	M	Fair	Good	Tree within visually significant group, suppressed form from and north, multi stemmed at 2m above ground level. Integral tree to the group	40+	B2
T5	Populus tremula - Aspen	20	4	8	8	8	1000	1	3	South	M	Fair	Good	Suppressed form from and north, twin stem at 2m above ground level. Good quality individual specimen	40+	B2
T6	Aesculus hippocastanum - Horse Chestnut	20	4	2	4	4	400	1	3	West	M	Fair	Good	Tree growing under canopy of adjacent poplar, no particular merit	40+	C2
T7	Acer pseudoplatanus - Sycamore	10	4	3	5	5	300, 300, 300, 300	4	1	East	SM	Fair	Good	Trees grown a out from an old hedge line, now forming full canopies	40+	C2
T8	Acer pseudoplatanus - Sycamore	10	5	5	5	5	400, 400	2	2	East	EM	Fair	Good	Twin stemmed from ground level. Full canopy, with some amenity value, heavy ivy growth throughout	40+	C2
T9*	Ilex aquifolium - Common Holly	5	2	2	2	2	200	1	1	East	SM	Good	Good	Offsite unremarkable hedge tree	40+	C2
T10*	Picea abies - Norway spruce	5	2	2	2	2	400	1	1	East	SM	Good	Good	Offsite unremarkable small conifer	40+	C2
T11	Quercus robur - Pedunculate Oak	10	5	5	5	5	500	1	1	North	EM	Good	Good	Well formed good condition oak tree with good long term potential	40+	B2
T12	Quercus robur - Pedunculate Oak	10	7	4	7	7	700	1	1	South	EM	Good	Good	Well formed good condition oak tree with good long term potential	40+	B2
T13*	Quercus robur - Pedunculate Oak	10	7	7	7	7	700	1	0	South	EM	Good	Good	Offsite and unable to access. Well formed, good condition oak tree with good long term potential	40+	B2
T14	Prunus avium - Wild Cherry	10	3	3	3	3	300	1	1	South	SM	Good	Good	Unable to access stem, standard tree grown out of hedge	40+	C2
T15	Prunus avium - Wild Cherry	10	3	3	3	3	300	1	0	South	SM	Good	Good	Unable to access stem, standard tree grown out of hedge	40+	C2
T16	Acer pseudoplatanus - Sycamore	10	3	3	3	3	300	1	0	South	SM	Good	Good	Unable to access stem, standard tree grown out of hedge	40+	C2

Note: This survey is based on a brief visual inspection from the ground.

It is not intended as a full arboricultural inspection.

- indicates estimated/offsite tree.

Ref. no	Species	Height (m)	Crown spread (m)				Stem dia. (mm)	Stem no. at 1.5m	Height of crown clearance (m)	Dir/ height	Age class	Structural Condition	Physiological Condition	General Observations Management Recommendations	Estimated remaining contribution (yrs)	Tree Quality Category (BS5837)
			N	S	E	W										
T17	Salix caprea - Goat Willow	10	4	4	4	4	300, 300	2	2	South	SM	Good	Good	Twin stem growing out of hedgerow	40+	C2
T18	Acer pseudoplatanus - Sycamore	10	4	4	4	4	300, 300	2	0	South	SM	Good	Good	Twin stem growing out of hedgerow	40+	C2
T19	Populus tremula - Aspen	10	12	0	10	8	1000	1	2	North	M	Good	Good	Large tree with north lean away from adjacent tree. Good tree as part of a group. Twin stem at 3m	40+	B2
T20	Populus tremula - Aspen	10	7	8	10	8	1000	1	3	East	M	Good	Good	Large tree with north lean away from adjacent tree. Good tree as part of a group. Twin stem at 2m	40+	B2
T21	Populus tremula - Aspen	10	8	8	8	8	600, 600, 600	3	5	South	M	Good	Good	3 large stems from ground level. Tree grown within group	40+	B2
T22	Populus tremula - Aspen	10	8	8	8	6	600	1	0	South	M	Good	Good	Smaller poplar within group of large poplar trees	40+	C2
T23	Populus alba - White Poplar	15	8	6	6	6	500	1	3	South	M	Good	Good	Individual tree growing from within a group of smaller understory trees	40+	B2
G1	Acer pseudoplatanus - Sycamore]	10	as shown.				200-300	-	-	-	SM-EM	Fair	Fair	Old hedgerow managed trees that have now grown out into full canopied trees. Group of approx. 13 stems	40+	C2
G2	Populus tremula - Aspen	15	as shown.				500-700	-	-	-	M-M	Fair	Good	Group of 3 poplar trees in good condition	40+	B2
G3	Populus tremula - Aspen	15	as shown.				400-600	-	-	-	EM-EM	Good	Good	Group of 7 stems. Good conditioned trees	40+	B2
G4	Quercus robur - Pedunculate Oak] Acer campestre - Field Maple] Crataegus monogyna - Common Hawthorn] Acer pseudoplatanus - Sycamore]	15	as shown.				200-600	-	-	-	Y-SM	Good	Good	Understory group beneath large poplars	40+	C2
G5	Populus nigra 'Italica' - Lombardy Poplar] Populus tremula - Aspen] Prunus avium - Wild Cherry] Cupressus macrocarpa - Monterey Cypress] Betula pendula - Silver Birch] Pinus sylvestris - Scots Pine]	15	as shown.				200-500	-	-	-	Y-M	Good	Good	Long linier group of mainly large Aspen trees with established understory	40+	B2
G6	Populus tremula - Aspen] Prunus avium - Wild Cherry] Fraxinus excelsior - Common Ash]	10	as shown.				200-500	-	-	-	Y-M	Good	Good	Linier boundary group of large Aspen and smaller understorey cherry, serves a good landscape feature	40+	B2
G7	Populus x canadensis - Hybrid Black Poplar] Prunus avium - Wild Cherry]	15	as shown.				200-600	-	-	-	Y-M	Good	Good	Small group of mainly Aspen with some small cherry trees as undergrowth, good landscape feature	40+	B2

Note: This survey is based on a brief visual inspection from the ground.

It is not intended as a full arboricultural inspection.

- indicates estimated/offsite tree.

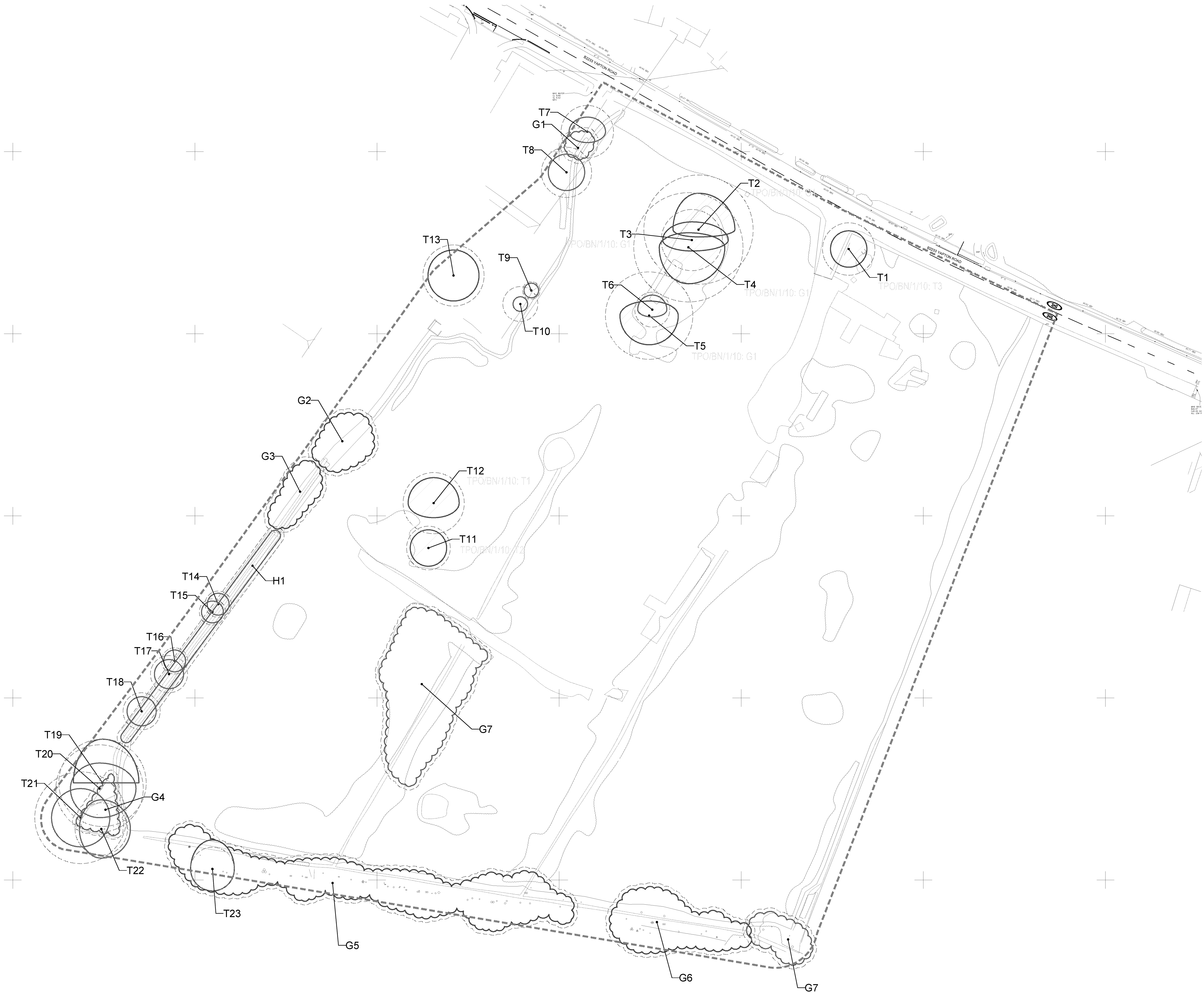
Ref. no	Species	Height (m)	Crown spread (m)				Stem dia. (mm)	Stem no. at 1.5m	Height of crown clearance (m)	Dir/ height	Age class	Structural Condition	Physiological Condition	General Observations Management Recommendations	Estimated remaining contribution (yrs)	Tree Quality Category (BS5837)
			N	S	E	W										
G8	Populus tremula - Aspen	5	as shown.				100-200	-	-	-	Y-Y	Good	Good	Small group of coppiced poplar with approx. 2-3 yrs. regrowth. No particular merit. Should not be regarded as a constraint to development	40+	C2
H1	Prunus avium - Wild Cherry] Acer campestre - Field Maple] Crataegus monogyna - Common Hawthorn]	5	as shown.				100-300	-	-	-	Y-EM	Good	Good	Unmanaged hedgerow with some standard trees growing throughout	40+	C2

Note: This survey is based on a brief visual inspection from the ground.
It is not intended as a full arboricultural inspection.
- indicates estimated/offsite tree.



Appendix B

Tree Constraints Plan JSL3362_700



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Notes

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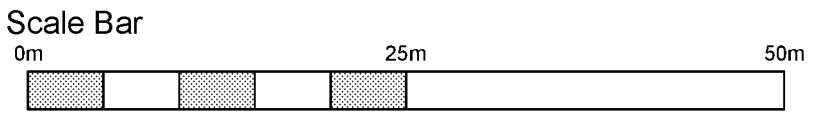
Key

- Survey boundary.
- Tree with numbered reference. Canopy spread and BS5837:2012 tree quality category as shown below.
- Vegetation group with numbered reference. Canopy extents and BS5837:2012 tree quality category as shown below.
- Hedge with numbered reference. Width and BS5837:2012 tree quality category as shown below.

BS 5837:2012 Tree Quality Categories - Table 1

- Category A - High quality
 - Category B - Moderate quality
 - Category C - Low quality
 - Category U - Unsuitable for retention
- Trees protected by Arun DC - Tree Preservation Order reference - TPO/BN/1/10.
- Root protection area (RPA) Calculated in accordance with Section 4.6 - BS5837:2012

- NOTES:
- Refer to RPS Tree Survey Report & Schedule for further details.
 - Survey based on a visual inspection from the ground and is not intended as a full arboricultural inspection.
 - Plan produced in accordance with recommendations set out in BS 5837:2012 - 'Trees in Relation to design, demolition and construction'.
 - Due to the legal protection afforded to breeding birds, vegetation removal should not take place during the bird nesting period, generally, although not restricted to, March - August inclusive.
 - Survey based upon topographic survey produced by MK Surveys in Horsham, July 2019.



Rev	Description	By	CB	Date
-----	-------------	----	----	------



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Client **Redrow Homes**

Project **Angels Nursery Barnham**

Title **Tree Survey**

Status **For Information** Drawn By **AB** PM/Checked by **DC**

Job Ref **JSL3362** Scale @ **A1** Date Created **August 2019**
1:500

RPS Drawing / Figure Number **700** Rev **-**

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Appendix C

Tree Protection and Removal Plan JSL3362_702A



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Key

- Tree with numbered reference.
Canopy spread and BS5837:2012 tree quality category as shown below.
- Vegetation group with numbered reference.
Canopy extents and BS5837:2012 tree quality category as shown below.
- Hedge with numbered reference.
Width and BS5837:2012 tree quality category as shown below.

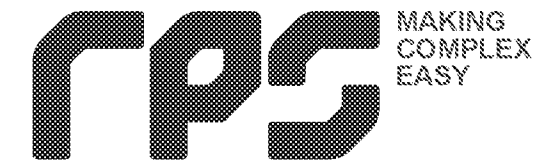
BS 5837:2012 Tree Quality Categories - Table 1

- Category A - High quality
- Category B - Moderate quality
- Category C - Low quality
- Category U - Unsuitable for retention
- Trees protected by Arun DC - Tree Preservation Order reference - TPO/BN/1/10.
- Root protection area (RPA)
Calculated in accordance with Section 4.6 - BS5837:2012
- Tree to be removed with numbered reference.
Canopy spread and BS5837:2012 tree quality category.
- Vegetation group or hedge to be removed with numbered reference.
Canopy spread and BS5837:2012 tree quality category.
- Temporary protective fencing in accordance with Section 6.2 - BS5837:2012. See inset details for example barriers.
- Excavation to be completed by hand, any required root pruning to be in accordance with BS 3998. Pruning of roots over 25mmØ to be monitored by arboriculturalist, with ongoing monitoring of trees condition by an arboriculturalist being recommended.
- Above ground construction requiring "No-dig" design principles in accordance with the AMS JSL362_770
- Surface area to be protected in accordance with Section 6.2.3 BS - 5837:2012 and AMS JSL362_770 section 6.

NOTES:

- Refer to RPS Tree Survey Report & Schedule for further details.
- Survey based on a visual inspection from the ground and is not intended as a full arboricultural inspection.
- Plan produced in accordance with recommendations set out in BS 5837:2012 - "Trees in Relation to design, demolition and construction".
- Due to the legal protection afforded to breeding birds vegetation removal should not take place during the bird nesting period, generally, although not restricted to, March - August inclusive.
- Survey based upon topographic survey produced by MK Surveys in Horsham, July 2019.
- Pedestrian/vehicular emergency access routes to be maintained at all times.
- All protective fencing to be completed and approved by LPA / CA prior to commencement of any site works.
- All works to conform with requirements of:
 - BS 3998:2010 - Tree Works
 - BS 5837:2012 - Trees in relation to design, demolition and construction

A	Update layout	DC	DC	06.20
Rev	Description	By	CB	Date



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Client **Redrow Homes**

Project **Angel & Hyde Nursery
Barnham, Bognor Regis**

Title **Tree Protection Plan**

Status For Planning	Drawn By AB	PM/Checked by DC
Job Ref JSL362	Scale @ A1 1:500	Date Created October 2020
RPS Drawing / Figure Number 702	Rev A	
rpsgroup.com		

Appendix D

Root Protection Area Fencing Details

Protective Fencing Specifications

Since trees are living organisms which interact with their immediate environment any changes made to their surroundings may have a bearing on that tree's future. Developing a site will undoubtedly place any trees within close proximity under some level of stress, which could predispose them to infection.

The most effective way of offering protection is by erecting protective barriers set at a distance from the tree stem using the methods given within BS 5837: 2012 Trees in Relation to Construction. Barriers should be braced and constructed to resist impacts; see figures below for barrier specifications.

Barriers should be erected before any works commence on site with the exception of recommended tree work. Areas of retained and future structure planting should be similarly protected.

All personnel should be made aware of the protected areas and instructed to keep them free of materials, waste and excess soil. Soil disturbance should be prohibited and travel of any kind, including foot traffic should also be excluded within the root protection area (RPA) unless previously agreed and adequate ground protection has been installed. Where foot traffic is agreed within the RPA, single thickness scaffold boards laid over a compressible material on a geotextile or supported by scaffold should suffice. Where vehicular access through the RPA is agreed an engineer should be consulted to design adequate ground protection methods.

Suggested Barrier Specification (as per BS5837: 2012)

Figure 1

Figure 2 Default specification for protective barrier

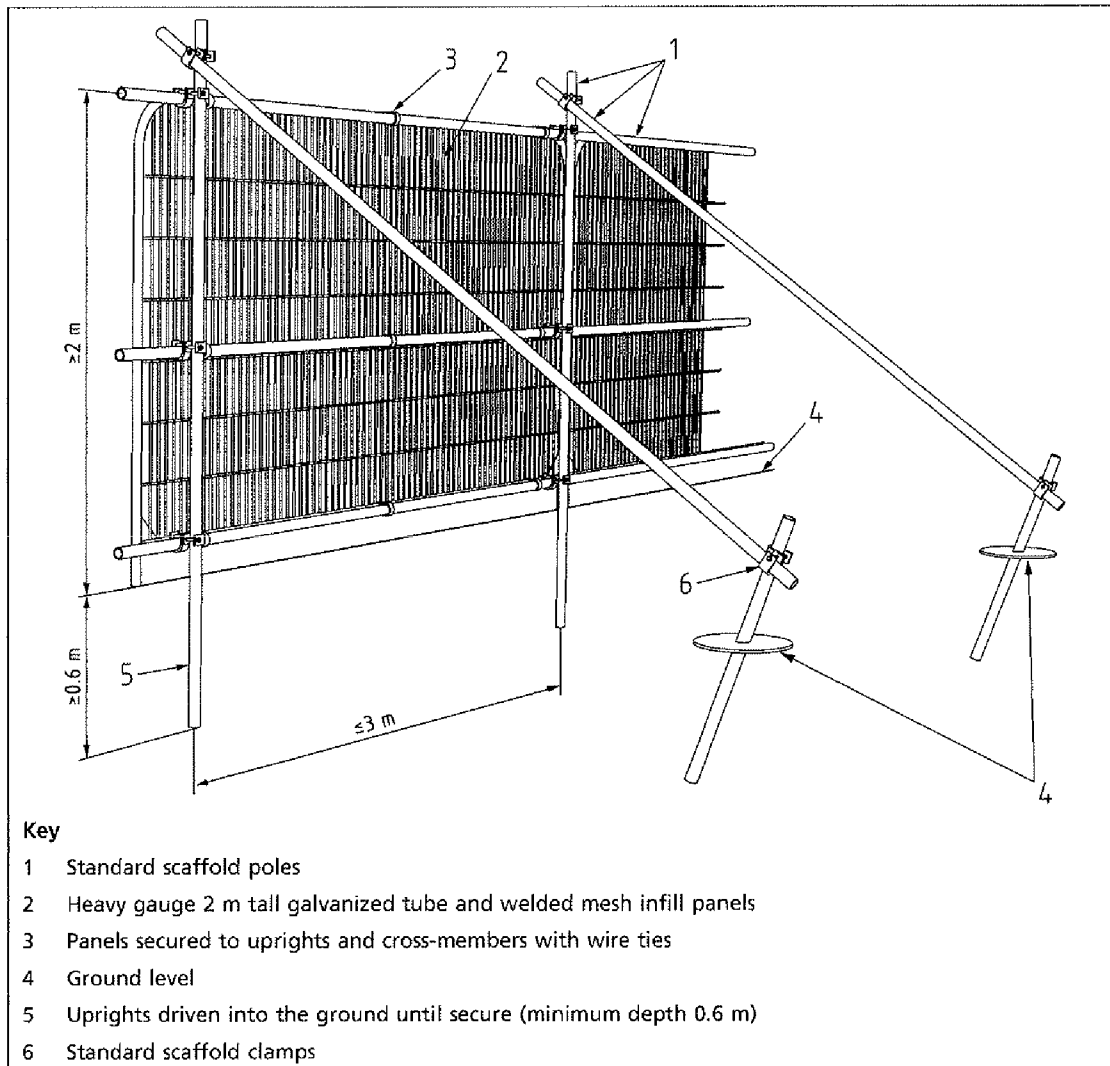
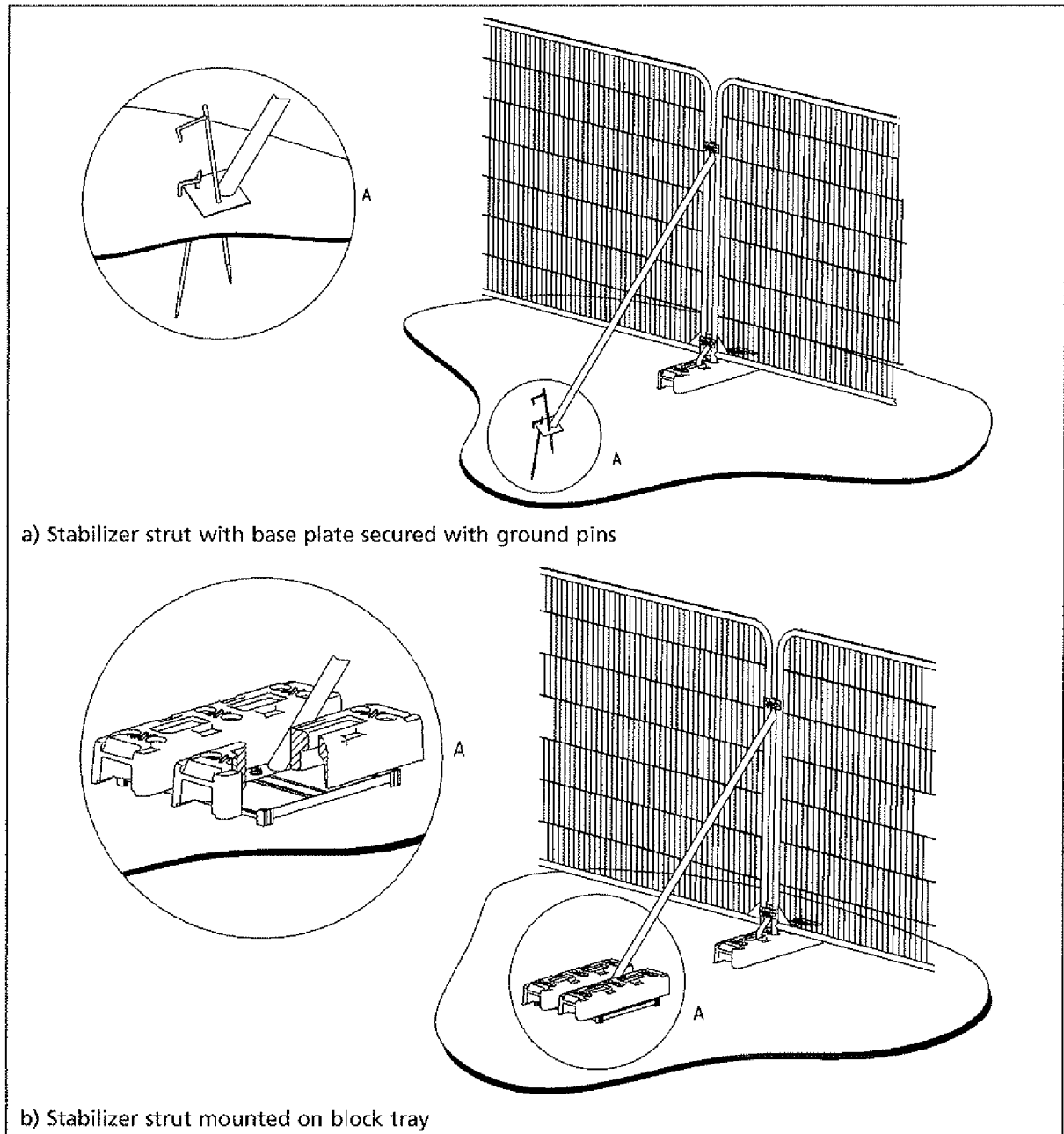


Figure 2

Figure 3 Examples of above-ground stabilizing systems



Appendix E

Construction Exclusion Zone (CEZ) Signage

