77 Brookmans Avenue, Brookmans Park

PART 1 BS5837 TREE SURVEY, PART 2 ARBORICULTURAL IMPACT ASSESSMENT AND METHOD STATEMENT.

Demolition of the existing building with replacement of a new detached property

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Ref. 820

1. Introduction

1.1 Contacts

- Client: Alexander Gemini Ltd.
- Arboriculturalist: Elizabeth Greenwood.
- Council: Welwyn Hatfield Council.

1.2 Testimonials

1.2.1 I am a Chartered Landscape Architect with 30 years of experience both in Local Government and in the private sector. My practice is registered with the Landscape Institute. I am also an arboriculturalist, holding the professional diploma in arboriculture. I am a Fellow of the Arboricultural Association.

1.3 Instruction

- 1.3.1 I have been appointed by Alexander Gemini Ltd
- 1.3.2 The development proposal is for the demolition of the existing building and its replacement with a new building

1.4 Scope

1.4.1 This report is carried out in accordance with BS5837. This document states the following with regard to scope:

'This British Standard gives recommendations and guidance on the relationship between trees and design, demolition and construction processes.

It sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.

The standard is applicable whether or not planning permission is required. (The British Standards Institution, 2012)

- 1.4.2 This report is intended to be a working document to be used by the contractor and local authority to ensure the retention of the trees and provide a means of construction for the implementation of the proposed development with minimal disturbance to trees and notable vegetation.
- 1.4.3. The survey is to take the form of a visual assessment of trees recording their measurement, describing their age, amenity, condition and recommending work. Trees have been plotted on plan and full details of survey work are included in the appendices.
- 1.4.4. Limitations of this tree survey would include the lack of visibility of every tree owing to dense undergrowth and the presence of climbing plants such as ivy. There may be restrictions to the access within the site or from neighbouring land, and, in the case of trees growing on the boundary of the site only one side of the tree may be visible.
- 1.4.5. In the case of building within the vicinity of mature trees the owners must be made aware of their responsibility to maintain these trees in a safe condition. Their insurers should be made aware of the implications of the presence of these trees.

1.5 Background

- 1.5.1. This detached property midway along the northern side of Brookmans Park and backs onto the Brookmans Park Golf Club.
- 1.5.2. A topographical survey plans shows that the ground if relatively level along the front drive, and within the rear garden a gentle slope of 2 metres descending to the rear boundary. There are no water features within the garden or indication of impeded drainage
- 1.5.3. The garden is laid to lawn with hedges and shrubbery along the garden boundaries. An overgrown plating bed lies on the eastern side of the rear garden with trees along the garden boundaries. An overgrown planting bed occupies some of the rear lawn.
- 1.5.4. Only one tree appears to predate the estate, a beech tree on the western boundary of the garden. Other trees are of more recent origin.
- 1.5.5. The trees are currently not protected by a Tree Preservation Order, they are not growing within a Conservation Area, and are not protected by any other Planning Legislation. This situation may change, and the client is advised to make further inquiries prior to any tree work.

1.5.6 **Geological Description:**

Bedrock Geology: London Clay Formation - Clay, silts and sands. **Superficial Deposits:** the property lies on the boundary of the Lowesoft formation of glacial till and Kesgrave formation of sands and gravels.

1.5.2 **Soil**

Soilscape 18:

Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils • **Texture:** Loamy and clayey.

- **Drainage:** Impeded drainage
- **Fertility:** Moderate
- Habitats: Seasonally wet pastures and woodlands
- Landcover: Grassland and arable some woodland
- Carbon: Low
- Drains to: Stream network
- Water protection Main risks are associated with overland flow from compacted or poached fields. Organic slurry, dirty water, fertiliser, pathogens and fine sediment can all move in suspension or solution with overland flow or drain water

1.6 Documentation

- 1.6.1. The following documents were provided before the commencement of this report:
 - A topographical survey has been prepared by Icelabz Survey, drawing number MB-SURV-PA-TS-001
 - A site layout plans has been provided by Alexander Gemini plan reference SH13 revision DH11
- 1.6.2. Plans showing the details as outlined in this method statement are included in the appendix to this report (Appendices G, H and I)

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1.7 Survey

- The site was visited on 18/06/2018.
- Clear skies, sunny 25 degree and gentle breeze
- With good visibility
- Photographs were taken of the trees, which are included in Appendix A.
- The camera used to take these photographs was an Olympus digital 6 pixel 6.3-63mm lens

2. Tree Survey Criteria

2.1 Outline

- 2.1.1. Photographs of many of the trees and full details of this tree survey are included on tree survey sheets. (Appendices A and B) The information recorded complies with BS5837:2012, and is outlined as follows: -
 - The species (English names), size and position of the trees within the site.
 - The majority of large shrubs or trees with stem diameter of less than 150 mm have not been surveyed. According to the British Standard Recommendations. These trees can be transplanted or replaced.
 - The dimensions of the trees are the height, and the girth measured at 1.5 metre above ground level. The spread is measured at the four points of the compass, and this is represented on plan. The lowest branch on the trunk is measured from ground level and the crown height is measured from the lowest point of the foliage.
 - The maturity is recorded, and details of this classification are included on the tree survey sheets. (e.g. Y = young, SM = semi-mature, EM = early mature, M = mature, OM = overmature);
 - A description of the trees' condition includes any visual defects at the time of the survey. As this survey is conducted from ground level not all defects may be visible, and pathogens may not be apparent because of the season of inspection.
 - General recommendations for each tree are outlined, which may need to be reviewed once development proposals are finalized.
 - Estimated remaining contribution in years in view of the existing site conditions is classified as (less than 10 years; 10 to 20 years, 20 to 40 years or more than 40 years).
- 2.1.2. Tree survey information has been added to the [TOPOGRAPHICAL/PROPOSALS] plan and details have been amended for the purpose of this report. Appendix [#].
- 2.1.3. It is important to note that the survey and evaluation of trees is only relevant to site conditions at the time of survey. If there is any change in the site conditions, and especially within the root protection area the trees, the site may need to be re-surveyed and the potential longevity of the trees re-evaluated. In the event of adverse weather conditions, the survey should be repeated or rescheduled.
- 2.1.4. Regardless of the development proposals there should be regular inspection and monitoring of trees at a frequency dependent on their condition and age. **This tree survey is only valid for a 3-year period from the date of the survey.**

2.2 Guidance

2.2.1. British Standard 5837:2012: 'Trees In relation to design, demolition and construction – Recommendations'.

2.2.2. Categories:

The aim of the guidelines is to provide an assessment of the amenity values of the trees. The recommendations provide four categories in which trees should be placed for assessment purposes. These assessment categories are reproduced in Appendix C, Table1, "Cascade Chart for Tree Quality Assessment", and simplified as:

- A. Trees of high quality with an estimated remaining life expectancy of at least 40 years
- B. Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
- C. Trees of low quality, with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter of below 150mm
- U. Trees which have limited prognosis. 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.

These categories are subdivided into three sub-groups:

- 1. Trees of arboricultural value, good examples of their species or unusual specimens.
- 2. Mainly trees of landscape value, trees which are primarily of visual amenity.
- 3. Trees with mainly conservational value, for example veteran trees.

2.2.3. Root Protection Areas:

The British Standard Recommendations 5837:2012 provide a formula for calculating the Root Protection Area (RPA) required to be protected for existing trees that area to be retained.

- For single stem trees, the RPA (see 3.7) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods below should be used. In all cases, the stem diameter(s) should be measured in accordance with Annex C, and the RPA should be determined from Annex D. The calculated RPA for each tree should be capped to 707 m2.
- For trees with two to five stems, the combined stem diameter should be calculated as follows:

 $\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 + \dots (\text{stem diameter 5})^2}$

• For trees with more than five stems (not illustrated in Annex C), the combined stem diameter should be calculated as follows: $\sqrt{(mean \ stem \ diameter)^2 \ \times number \ of \ stems}$

Root protection areas are indicated as a radius on plan. In the event of root restrictions from, for example, deep foundations or a retaining wall, topography, drainage, soil type, soil structure, or soil disturbance the approximate area is represented by a polygon, as dictated by this British Standard.

2.2.4. Protective Fencing and Root Protection:

Within development sites the British Standard recommends that trees are fenced off to ensure the root protection area is not damaged by construction works. In compliance with the British Standards, protective fencing should be erected at the edge of the root

protection area. If access is required within this area, then the ground should be protected. Construction techniques using geo-web and geo-textile, in accordance with BS recommendations might be used to minimize damage to trees and enable working space for demolition or construction within the root protection area of trees.

Drainage and service runs need to be identified at this stage to ensure that if new service runs are to be excavated they should be located outside the root protection zone of existing trees.

Building foundations can be specifically designed to reduce the impact of a building if there is a minor incursion into the root protection area of a tree.

2.2.5. Other Considerations:

In addition, the British Standard takes into account future growth of the crown of the tree, the spatial implications and its effects on light.

Existing levels within the root protection areas of trees should be retained.

Some tree work might be required to ensure that the crowns of trees are cut back from working space and to provide access for construction vehicles.

There are adequate areas within the site to ensure that handling and storage of materials can be accommodated well outside the root protection areas.

3. Tree Survey

3.1 Summary

- 3.1.1. A total of 6 trees and one group of trees were surveyed. Along the grass verge of Brookmans Avenue there is a purple leaved plum (T1) a good quality tree which partly overhangs the roadway.
- 3.1.2. On the western side of the front garden and close to the property there is a twin stemmed magnolia, although of amenity value it has a limited prognosis and is assessed as a 'C2' quality tree.
- 3.1.3. Of most significance is the beech tree, 16-metre-high with a 146 square root protection area. It trunk dived at 5 metres with the tight fork with co-dominant stems, which may cause structural weakness in the long term.
- 3.1.4. Two immature trees are growing within dense shrubbery on the eastern side of the garden, a fustigate juniper (T5) and a Bhutan pine (T6).
- 3.1.5 The boundaries include hedges and shrubs, with a high hedge of laurel (Hx) on the western side and group of mixed Leyland and Lawson conifers 6 metre high
- 3.1.6. Hedges are described in the following table

Кеу	Species	Height	Crown spread	Stem girth	RPA from hedge base	Management
H1	Yew and cypress	2m	Up to 1metre	150mm	2m	Retain as clipped hedge
H2	Laurel	4.5m	2- 3metre	Multi- stem- 200mm	2.5m	Retain as clipped hedges- consider crown reduction
H3	Lonicera nitida	1.5m	Up to 1metre	50mm	2m	Retain as clipped hedge

3.2 Categories

3.2 The British standard categorization has been reproduced in appendix C of this report. This tree survey has identified the following trees in each category as follows:

			-
Category	Number	Tag Number	Species
	of Trees		
А			
В	3	T1, T3, T4	Purple leaved plum, beech and juniper
С	2	T2, T5	Magnolia and Bhutan pine and group pf mixed
	+1 Group		cypresses
U			
Total	5 and one		
	group		

Trees:

4. Arboricultural Impact Assessment

4.1 The proposed site layout has been provided by Alexander Gemini PlaSH13 revision DH11with the new property extending out from the footprint of the existing dwelling

4.2 Summary of Impact

The impact of these proposals and mitigation requirements are summarized in the following table:

No.	Species	Effect	Tree Surgery	Protective Barrier
T2	Magnolia	Within 2 metres of the building	REMOVE	
		with demolition and		
		construction		
H2	Laurel hedge	Partly within footprint of new	REMOVE	
		building		
Т3-	various	Outside construction zone		Х
T6				
H1	Yew/Lawson	Outside construction zone		Х
	cypress			
	hedge			

5. Arboricultural Impact Assessment

5.1 Method of working

5.1.1. Issues Considered

- Pre-construction works and site clearance:
- Tree protection
- Tree surgery
- Protective fencing
- Methods of ground protection construction during works
- Demolition

Construction works:

- Hand dig
- Hard surfacing within the root protection area
- Location of underground services
- Contingency plans
- Site supervision

Post- Construction works:

- Removal of protective barrier etc...
- New surfacing
- Remedial works
- Landscape works

5.2.2. General:

The plans for demolition and construction for a new dwelling show a replacement house is a similar position, with some further encroachment of the building footprint on the north side of the plot.

5.2 Pre-construction

5.2.1 Tree Works

As part of the application for planning permission the following tree surgery is outlined. All works will be carried out by a fully insured and competent tree surgeon in accordance with BS3889:2010 "Tree Work". The timing of tree surgery should also be carried out in accordance with the Wildlife and Countryside Act and in view of the nesting season of birds within the sites.

	•		
No.	Species	Category	Recommendations
т2	Magnolia	C2	Too close to demolition and re-construction works to enable retention
H1	Laurel hedge		Too close to demolition and re-construction works to enable retention

Management:

Removal of Trees:

Only one tree, a 'C2' quality magnolia is to be removed.

Tree Survey, Arboricultural Impact Assessment and Method Statement. 77 Brookmans Avenue, Brookmans Park. AL9 7QG

5.2 Tree Protection

5.2.1. Protective Fencing/Protective Barrier

Details of the fencing are shown in the appendices to this report and comply with British Standard recommendations. (see appendix D). All weather notices are to be affixed to this fencing with signage "CONSTRUCTION EXCLUSION ZONE – NO ACCESS".

5.2.2. Ground Protection

In the vicinity of the temporary unit working space will mainly be confined to existing hard surfacing. Where additional working space is required for construction within the root protection areas of retained trees, the British Standard specifies the following type of ground protection.

- a) For pedestrian movements only, 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 (e.g. 100 mm depth of woodchip), laid onto a geo-textile membrane;
- b) 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. 150 mm depth of woodchip), laid onto a geo-textile membrane;
- c) For wheeled or tracked construction traffic exceeding 2t 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.

5.2.3. Demolition

- a) Prior to demolition the trees and hedges to be retained should be fenced off and ground protection installed within their root protection area.
- b) For the trees along the drive the crown should be faced back to ensure there is clearance under the canopy to remove building materials
- c) All heavy machinery and demolition vehicles should be positioned within the footprint of the building.
- d) No material should be stored under the tree canopies
- e) All hard surfacing to be removed by hand with care so as not to damage tree roots and stored outside the tree root protection areas.
- f) If temporary surfacing is required, this should be in accordance with ground protection outlined above.

5.3 Methods of Construction for Development

5.3.1 Hand dig

Hand digging will also be required for all works within root protection areas of trees, including removal of surfacing, trenches, excavation for fence post and for cultivation for soft landscape areas. All hand digging within the root protection areas of trees should be supervised by a competent arboriculturalist.

Within root protection areas all excavation should be hand dug. A trench should be hand dug near the trees to ascertain whether roots are present. If roots over 50mm are found these should, where possible, be bridged, and surrounded by sand- roots under this

dimension should be cut to a clean cut and surrounded by sand. No roots are to be left exposed but covered with damp sand or hessian. The surface level of the path may need to be adjusted to retain these roots.

If on investigation of the hand dug trench there are no roots present mechanical excavation may be possible if a banksman is supervising the excavation to ensure that if roots are unearthed they can be protected and clean cut and surrounded by sand. Hand digging may need to be resumed to complete the excavation.

This would include exploratory excavation by hand for the foundations of the paths and new hard surfacing within the root protection area of the trees.

5.3.2. Surfacing within the Root Protection Area

Hand digging will also be required for any excavations. The following measures should also be employed to minimise damage to tree roots.

- a) Minimizing excavation within the root protection area by removing surfacing herbage and laying a geo-textile to stabilize the ground.
- b) Infill any irregularities with 50mm sharp sand
- c) On this lay a geo web, depth to be specified by the supplier to accommodate the proposed weight load.
- d) This will be filled with no fines gravel/stone 20-40mm
- e) Lay final wearing surface on top of this base- for example permeable paving or porous tarmac.
- f) Use timber edging to avoid excessive excavation to facilitate haunching of edging.

5.3.3 Location of Underground Services

All drainage and below ground services will be designed to avoid tree protection zones. If there is no alternative but to site these within the root protection area of trees, then trenches excavation should be hand dug and comply with 'Hand dug ' as outlined in section 5.1 or the NJUG regulations.

5.3.4. Contingency Plans

If vehicular access is necessary within the root protection zone of any of the trees, in response to chemical spillage, collision or emergency access, the ground will be protected by geo-textile or boarding as outlined in the British Standard. Spillage and ground contamination will be prevented, and preparation of material carried out outside the root protection areas of tree.

5.3.5. Site Supervision

There will be full supervision on site from the site foreman and tree protection methods will be strictly adhered to. An arboricultural supervision schedule, if required by the local authority, is included in the appendices to this report.

5.4 Post Construction and Landscaping near Trees.

5.4.1. Removal of fencing and ground protection

On completion of works, protective fencing and the ground protection for temporary working space will be removed.

5.4.2 Remedial works and soil improvement

Exposed soils are easily compacted resulting in loss of water and gaseous exchange and leading to root deaths. To relieve ground compaction, which may have resulted from the overrun of vehicles or by storage of materials, the clay soils should be broken up to allow air to penetrate and for the soil structure to be restored.

Within the tree root protection area improve the soil structure by incorporating a compost or mulch within the topsoil, of 75-100mm in depth. This can be spread over the surface and gently forked into the soil. If bark chip is used as a mulch NPK fertilizer should be added to counteract the nitrogen depletion of the soil. There are options for additives of mycorrhizal fungal which may also improve root function. Ground compaction will be addressed by either lightly forking over the area or by other techniques; for example, use of tree spade soil aeration.

5.4.3 New surfacing

Within the root protection areas, the surface overlying the root protection areas of trees will be laid as outlined in section 3.6.3., on either the existing geo-web base or on a new geo-web base, with no excavation within these root protection areas.

5.4.4 New planting and soft landscape

New planting within the root protection areas of trees should be carried out to avoid mechanical cultivation and for plants to be notch planted. Shrub beds are to be mulched, which, in addition to reducing weed growth, will enhance soil conditions round trees. Within grass areas, the height of mower blades are to be set above the level of surface tree roots to avoid damage and soil level raised above surface roots with a sandy composition of topsoil

Elizabeth Greenwood C.M.L.I., F.Arbor.A June 2018

Appendix A: Photographs



Above left - the purple leaved plum (T1) (Street tree). **Above centre**- the twin stememd magnolia (T2). **Above right** -the beech tree (T3). Below left the juniper. Below centre - the immature Bhutan pine (T5). Below right bounday laurel hedging withint he side garden of 75 Brookmans Avenue.



Bottom left- the grup of confier (G2) formed as a high hedge, with laurels (H2). **Bottom right** -the yew hedge (H1) along the eastern side of the front garden



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Appendix B: Tree Survey Sheets

Tag	Species	Age	stem girth	Height	Category	North	East	South	West	Condition	life span	Comments	Recommendations	RPA radius	RPA sqm
T1	Prunus cerasifera Nigra (Purple leafed Plum)	М	230	7(2)	B2	3.9	3.5	3	3.2	Good	40+	Growing on verge. Grafted at base.		2.76	23.93
Т2	Magnolia (Magnolia)	М	228	5.5(1)	C2	2.7	2.6	2.7	2	Fair	20+	Tight forks. Pruple flowers. Devayi.	REMOVE	2.74	23.59
Т3	Fagus sylvatica (Beech)	М	550	15.75(7)	B2	5	5.2	4	4.4	Good	40+	Tight fork. Suppressed.		6.6	136.87
T4	Juniperus chinensis (Chinese Juniper)	SM	183	4.5(0)	B2	0.75	0.8	0.75	0.75	Good	40+			2.2	15.21
T5	Pinus wallichiana (Bhutan Pine)	EM	120	5.5(0)	C2	2	2	2.2	2.5	Fair	20+		could be transplanted	1.44	6.52
G1	Chamaecyparis lawsoniana (Lawson Cypress,X Cupressocyparis leylandii (Leyland Cyp,X Cupressocyparis leylandii Castlewellan	SM	150	7.25(0)	C2	2	2	2	2	Fair	20+		Maintain as clipped hedge with the option for height reduction	1.8	10.18
H2	Laurel hedge			5		2	2	2	2				REMOVE	2	

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Appendix C: Copy of BS5837:2012 Table 1 "Cascade Chart for Tree Quality Assessment"

Category	Criteria								
				plan)					
Category U (Formerly 'R')									
Those in such a conditions that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	Trees that have a serious, irremediable, struct unviable after removal of other category U tree Trees that are dead or are showing signs of s Trees infected with pathogens of significance trees of better quality potential conservation value which might be d	Trees that have a serious, irremediable, structural defect, such a that their early loss is expected due to collapse including those that will become unviable after removal of other category U trees (e.g. Where for whatever reason, the loss of companion shelter cannot be mitigated by pruning.) Trees that are dead or are showing signs of significant, immediate and irreversible overall decline. Trees infected with pathogens of significance to the health and/or so safety p of other trees nearby, or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have existing or potential conservation value which might be desirable to preserve							
Trees to consider for reter	tion								
	1. Mainly arboricultural qualities	2. Mainly landscape qualities	3. Mainly Conservation qualities						
Category A									
Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; those that are essential components of groups or formal or semi formal arboricultural features (e.g. The dominant and/or principal trees within an e avenue	Trees, groups or woodlands or particular visual importance as arboricultural and /or landscape features	Trees, group or woodlands of significant conservation, commemorative or other value (/e.g. Veteran trees or wood pasture)	Light Green (RAB 000-255-000)					
Category B									
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but downgraded because of impaired cons conditions (e.g. Presence of significant though remediable defects, including unsympathetic past management and storm damage) such as that they are unlikely to be suitable for retention beyond 40 years; or trees lacking the special quality necessary to merit category A designation	Tree present in numbers, usually growing in groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collections but situated a so as to make little visual contribution to the wider locality	Trees with materials conservation or other cultural c value	Mid blue (RAB -000- 000-255)					
Category C									
Trees of low quality, with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter of below 150mm	Unremarkable trees of limited merit such or such impaired condition that they do not qualify in higher categories.	Trees present in groups or woodlands but without this conferring on them significantly great collective landscape value; and/or tree offering low or only temporary/transient landscape benefits	Trees with no materials conservation or other cultural value	Grey (Rab 091-091- 091)					

Appendix D: Protective Barrier and Fencing

Standard scaffold poles	Uprights driven into the ground	Heavy gauge 2m tall galvanised tube and welded mesh infill panels Panels secured to upright with wire ties and where necessary scaffold clamps -Weld mesh wired to upright and horizontals
Standard clamps	4495	dismantling
Ground level 3 me		, i i i i i i i i i i i i i i i i i i i
Approximately 600mm driven into the ground		
Copy of BS 5837:2012 Figure 2 (abov	/e) and Figure 3 (be	low)
Protective barrier, examples of above systems (for Heras type fencing) Tote NOT TO SCALE	ve ground stabilizing al height 2.4metres	
a) stablizer strut with base plate secured with ground pins)Stablizer strut nounted on lock tray.	
F <i>.1</i>	This drawing is the copyri Elizabeth Greenwood C.I Arbor.A and may not be re in whole or in part without permission	ght of M.L.I., produced written
^{Scheme} <i>BS5837:2012</i>		Date October 2017
Title <i>Copy of Protective Barrier / Fencil</i> Scole <i>Drawings not to scale</i>	19	Drawn by <i>E.J.G</i> Job No
Elizabeth Greenwood C.M.L.I., F.Arbor.A.		Drg No
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Appendix E: Indicative Arboricultural Supervision

Item	*Site Supervision Visit Number	Estimated Timing	Inspection	Date of Visit
Meet site foremen and discuss works and program. Setting out site and protective fencing, ground protection- site organization.	Visit 1	Prior to site clearance and demolition	 Carry out tree removal and tree surgery and listed Fence off all trees to be retained prior to demolition and site work Provide and insert ground protection for the duration of construction works 	
Setting out building, foundation excavation, trenches	Visit 2	Prior to construction	 Carry out demolition and site clearance Set up site working area 	
Excavations/ changes of soil levels— and foundation and positioning of pile drivers details- inspect	Visit 3	During construction	 6. Carry out construction 7. For new drain run as marked hand-dig within RPA of trees. 8. For new surfacing insert ground protection as above for use of site works 	
On completion- removal of tree protection, planting and remedial works- removal	Visit 4	Post completion	 9. On completion of works remove protective fencing and ground protection 10. Carry out remedial works as listed prior to landscape works 11. Carry out landscape works 	

Appendix F: Plan 820.18.1 Tree Constraints Plan





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77 Brookmans Avenue, Brookmans Park	June 2018
Title Constraints Plan	Drawn by E.J.G
Scale 1:200 @ A2	<i>820.18.</i>
Elizabeth Greenwood C.M.L.I., F.Arbor.A. 10 Knight Street, Sawbridgeworth, Herts, CM21 9AT. Tel 01279 722381 mobile 07746867402, email ms.ejgreenwood@gmail.com	^{Drg №} <i>820.18.1</i> <i>Appendix</i> F

Appendix G: Plan 820.16.2 Tree Removal and Protection Plan



Protective Fencing/Protective Barrier

Details of the fencing are to comply with British Standard recommendations. All weather notices are to be affixed to this fencing with signage "CONSTRUCTION EXCLUSION ZONE - NO ACCESS".

Ground Protection

In the vicinity of the temporary unit working space will mainly be confined to existing hard surfacing. Where additional working space is required for construction within the root protection areas of retained trees, the British Standard specifies the following type of ground protection.

For pedestrian movements only, a single thickness of scaffold a) 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 (e.g. 100 mm depth of woodchip), laid onto a geo-textile membrane;

For pedestrian-operated plant up to a gross weight of 2 t, b) proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geo-textile membrane;

For wheeled or tracked construction traffic exceeding 2 t gross c) 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.

Hand dig

Hand digging will also be required for all works within root protection areas of trees, including removal of surfacing, trenches, excavation for fence post and for cultivation for soft landscape areas. All hand digging within the root protection areas of trees should be supervised by a competent arboriculturalist.

Within root protection areas all excavation should be hand dug. A trench should be hand dug near the trees to ascertain whether roots are present. If roots over 50mm are found these should, where possible, be bridged, and surrounded by sand- roots under this dimension should be cut to a clean cut and surrounded by sand. No roots are to be left exposed but covered with damp sand or hessian. The surface level of the path may need to be adjusted to retain these roots.

If on investigation of the hand dug trench there are no roots present mechanical excavation may be possible if a banksman is supervising the excavation to ensure that if roots are unearthed they can be protected and clean cut and surrounded by sand. Hand digging may need to be resumed to complete the excavation.

This would include exploratory excavation by hand for the foundations of the paths and new hard surfacing within the root protection area of the trees



Method of working

- standard.
- protection
- Hand dig within RPA of trees
- **EXCLUSION ZONES.**
- additional remedial works.

Tag	Species	Category	Recommendations
T1	Prunus cerasifera Nigra (Purple leafed Plum)	B2	
T2	Magnolia (Magnolia)	C2	REMOVE
Т3	Fagus sylvatica (Beech)	B2	
T4	Juniperus chinensis (Chinese Juniper)	B2	
T5	Pinus wallichiana (Bhutan Pine)	C2	Could be transplanted
G1	Chamaecyparis lawsoniana (Lawson Cypress,X Cupressocyparis leylandii (Leyland Cyp,X Cupressocyparis leylandii Castlewellan	C2	Retain clipping- maintain height
H2	Laurel hedge		REMOVE

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• Fencing off the trees as marked on plan with Heras style fencing in accordance with British

Lay ground protection where required ground

• Continue with site works as agreed with the LPA, within the area marked site construction area and exclude any works from the SITES

On completion of works remove ground protection and protective fencing and carry out

Cultivated by hand for all soft landscape works within the root protection areas of trees

• Monitor the condition of trees an annual basis

ookmans Avenue, Brookmans Park	Date June 2018
emoval and Protection Plan	Drawn by E.J.G
A2	JOD NO <i>820.18.</i>
enwood C.M.L.I., F.Arbor.A. et, Sawbridgeworth, Herts, CM21 9AT. 2381 mobile 07746867402, email ms.ejgreenwood@gmail.com	B20.18.2 Appendix G

Ref. 820

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