Arboricultural Report and Impact Assessment

Site – **Land adjacent to The Lodge, Rectory Lane, Rivenhall, Essex**

Client – **HW Developments Limited.**

Contact – **Steven Higgon HGN Design**

Date - **05-06-2021**

To be read in conjunction with – Tree Survey Plan Drawing No. HGN/RL/01

Moore Partners Ltd

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BS5837:20012 Tree Assessment

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1.0 Scope of works and client brief.

1.1 Steven Higgon has requested a survey of the trees around the land to the south of The Lodge. The survey is to accompany the planning application for 3 new dwellings on the site. The report should be read in conjunction with the tree constraints plan, drawing number HGN/RL/01

1.2 The report was to:

- assess the trees in line with BS5837:2012.
- prepare tree constraints plan.
- Address mitigation required as a result of the implications assessment.

2.0 Summary

2.1 The proposals are to construct 3 new dwellings on the site. These will be accessed off Rectory Lane by a new road.
Within the site are a number of semi mature trees, primarily around the boundaries. These vary in quality and landscape value. The largest trees are a row of Norway spruce on the southern boundary, two mature silver birch and early mature/mature oaks along the western boundary. The remaining trees are fruit trees or small ornamental species in the garden.

The two highest value trees are outside the site, and are 2 large mature oaks, the root areas of which extend into the site, so where included. There is a high native species hedge running round the boundary of the site along Rectory Lane, which forms a good screen between the road and the site.

To facilitate the development some trees will need to be removed, 6 U rated trees, 10 lower quality C rated trees, primarily fruit trees and small ornamentals, , and 3 higher quality B rated trees, Norway spruce and an early mature lime. An oak T 22 would require to be reduced on the east side by 2m. A small section of the hedge would need to be removed for the new access drive.
The hedge around the site and remaining trees would all be retained and protected during the build inline with BS5837.

Full details of the impacts on each tree and any mitigation required for protecting them is given in the chart in the implications assessment section 7 of this report.

3.0 Site

3.1 Site location

The site is the garden area to the south of the lodge, located to the west side of Rectory Lane. The site is primarily laid to grass with mature and early mature trees around the boundary. The most significant tree is a very large, old oak close to the garage. This is just outside the site but has been included as the root area is likely to extend into the site. The boundary of the site has been taken as the top of the ditch line running around the site.

fig 1 – site outlined in red.

3.2 Soils and levels

The site is relatively level but with a slight fall from north down to the south.
A desk top survey shows the soils in the area are slowly permeable seasonally wet acid loamy and clayey soils, as shown by the Cranfield Soil Institute; source Landis.org.
Bedrock geology is Claygate Member - Clay, Silt and Sand, source British Geological Survey.
This is a desk top survey. It is not a detailed soil analysis or site investigation, but a generic overview.

4.0 Statutory protection

4.1 Trees legislation

Tree Preservation Order (TPO)

Can be served on individual trees or groups of trees. The law requires written permission to be gained from the local authority prior to carrying out any works to a tree either above or below grounds. Failure to gain consent can be seen as wilful damage and lead to prosecution and significant fines.

Conservation Area Order

If a site lies within a conservation area designated by the local authority, trees over 75mm in stem diameter 1.5m high, are afforded protection under this statutory designation. The local authority must be notified in writing of any proposed works to a tree in a conservation area, or any activity that could affect the above or below ground parts of the tree. They have 6 weeks in which to object to the proposed works. Failure to comply with this can lead to prosecution and a fine.
An online check shows the site is not in a Conservation Area

Town and Country Planning Act 1948

The local planning authority has duty to ensure that when granting planning permission 'adequate provision is made for the preservation and planting of trees. This can include imposing planning conditions.

National Planning Policy Framework Section 11

This states that 'the local planning system should contribute to and enhance the natural and local environment by protection and enhancing valued landscape.' This includes recognising the benefits of ecosystem services and protecting biodiversity through protection and enhancement.

4.2 Wildlife legislation

There are statutory protections on British fauna. In particular bats and nesting birds can be impacted on when undertaking works on and around trees.

Bats

All British bats, as well as their roosts and breeding sites are protected under British Law. The Wildlife and Countryside Act 1981 schedule 5 and The Habitat Regulations make it an offence to

- Deliberately disturb bats.
- Damage, destroy or obstruct access to bat roosts.
- Possess or transport a bat or any art of a bat.

Birds

The Wildlife and Countryside Act 1981 makes it an offence to

- Intentionally kill injure or take a wild bird.
- Destroy a nest while in use or take or destroy eggs.

Under **The Countryside Rights of Way Act** 'unknowingly' committing an offence is no longer a defence. It is therefore imperative that appropriate action is taken by the landowner, or contractor, prior to commencing any works on trees that could be potential nesting sites or bat roosting sites. This may include, but is not limited to, trees with cavities, splits or holes and heavy infestations of ivy, particularly in reference to bats. Appropriate risk assessments should be made before works commence by competent persons.

5.0 Proposed Development

5.1 The proposal is for 3 new dwellings, accessed off Rectory Lane by a new driveway, garages, car parking and associated landscaping.

5.2 Reference documents supplied.

Drawing references	Author	Title	Date
9180.005	HGN	Proposed site layout	April 2019

6.0 Tree assessment

6.1 Survey method

The report is based on a ground level visual tree assessment, using recognised non-invasive techniques, (Mattheck). It is an external inspection only. Condition of the tree was assessed only on date of inspection. Physiological and structural assessments are valid for a period of no more 12 months. It remains valid only if no environmental changes occur around the tree. If any changes should occur, re-inspection should be carried out. Environmental changes around the tree will render the report invalid.
There has been no assessment of potential for indirect damage because of soil heave or subsidence that trees may have on existing properties, this is outside the remit of this report.
No internal diagnostic equipment was used, and no pest and disease samples were taken or sent away for analysis. No soil samples were taken for testing. If Soil analysis is required, a soil engineer should be employed. There has been no examination of existing drains or service runs for the presence of roots. No trial pits were dug to examine roots at the time of the tree survey.

The trees were surveyed in line with the process laid out in BS5837:2012. The trees were assessed against the criteria laid out in the British Standard. Data was collated on species, age, height, crown spread, stem diameter at 1.5m high. A base line assessment of physiological and structural condition was made. All trees were categorised in line with BS5837:2012 guidance. Trees of the highest quality were rated 'A', good quality 'B'. Trees rated 'C; are worthy of retention but of lower quality. Those given an 'R' rating are poor quality with either less than 10 useful life years remaining, small and of limited significance in the wider landscape, or could easily be replaced in a new landscape scheme with a tree of similar size and impact. Greater detail on the rating is given in the key in below.
Trees under 75mm in diameter were not recorded in line with BS5837 guidance. The details of the trees as required under BS5837:012 were recorded in tree data for this report.

Where trees been noted for works an assessment of condition has been made but this survey is an overview and cannot be relied on as a full health and safety assessment of the trees.

A topographical survey was not available for the tree positions within the site. The trees were measured using simple triangulation techniques. Though care is taken discrepancies can occur and if great accuracy is needed a topographical survey should be commissioned. The tree protection plan is based on this, and the current proposed site lay out available at the time of writing the report.

Key to survey schedule

Tree number on plan - T1 individual tree on the site

BS 5837:2012 Age class

Y – Young first third of life expectancy, EM – Early mature second third of life expectancy, Ma – Mature final third of life expectancy, OM – Over mature showing signs of senescence, V – Veteran over mature and of special conservation value

Remaining years in age bands - <10, 10-20, 20-40, >40

Physiological or structural condition - Good no significant health problems, or no significant structural problems, **Fair** some symptoms of ill health, or currently insignificant or remediable structural problems, **Poor** significant symptoms of ill health, or significant structural problems
Moribund (physiological only in serious and irreversible decline, **Dead** (physiological only) not alive

Other Abbreviations.

Esti estimated
M/S multi stem the number of stems and diameter are given in line with BS5837:2012 requirements.
N north, E east, S south, W west

BS 5837:2012 Category of quality/retention

Category	Description		
A Green	Trees of high quality A1 – Mainly arboricultural value A2 - Mainly landscape value A3 – Mainly cultural value, including conservation	C Grey	Trees of low quality C1 – Mainly arboricultural value C2 - Mainly landscape value C3 – Mainly cultural value, including conservation
B Blue	Trees of moderate quality B1 – Mainly arboricultural value B2 - Mainly landscape value B3 – Mainly cultural value, including conservation	U red	Trees that are in a poor condition, so that any existing value will be lost in the next 10 years, and should, for reasons of sound arboricultural management, be removed.

6.2 Tree data

No.	Species English & Latin	Approx Height (M)	Dia. @1.5 (CM)	Spread (M)	Height Crown Clearance (m)	Age Class	Physiological condition	Structural condition	Preliminary management recommendation	Years remaining	Category grading
T1	*Oak* *Quercus robur*	16	140	N 12 S 12.2 E 12 W 7.7	4.0m 1st main limb at 5.4m on west side	Ma	good	good	Na	40	A1,2,3
	High quality oak just to the north of the site.										
T2	*Lime* *Tilia europea*	9	31	N 3.5 S 3.5 E 3.5 W 3.0	1.2m 1st main limb at 2m on all sides	em	good	good	Na	40	B2,3
T3	*Sycamore cvr* *Acer psudoplatanus brilliantissima*	6	14	N 1 S 3 E 1 W 3	1	y	Fair	fait	Na	40	C2
T4	*Norway spruce* *Picea abies*	12	26	N 2 S 2 E 2 W2	2	em	poor	poor	remove	<10	U/C

No.	Species English & Latin	Approx Height (M)	Dia. @1.5 (CM)	Spread (M)	Height Crown Clearance (m)	Age Class	Physiological condition	Structural condition	Preliminary management recommendation	Years remaining	Category grading
T5	*Cherry* *Prunus avium*	3.5	11	N 2.0 S 2.0 E 1.0 W 3.5	1	em	fair/poor	fair/poor	Na	10	C/U
	Small tree with limited value in the wider landscape										
T6	*Field maple* *Acer campstre*	5	14	N 2.5 S 2.0 E 2.0 W 2.5	1.8	em	fair	fair	na	40	C2,3
T7	*Cherry* *Prunus avium*	14	18	N 4.0 S 4.0 E 4.0 W 4.0	4	em	good	fair	Na	20-40	C23
T8	*Oak* *Quercus robur*	14	90	N 8.0 S 8.0 E 8.0 W 8.5	5.0 m	Ma	Fair	Fair	Na	40+	A123
	This is a high-water demand species, on the east bank of the ditch, outside the site.										
T9	Norawy spruce Picea abies	10	16	N 1.0 S 1.0 E 1.0 W 1.0	3	em	dae	dae	fell	<10	U

No.	Species English & Latin	Approx Height (M)	Dia. @1.5 (CM)	Spread (M)	Height Crown Clearance (m)	Age Class	Physiological condition	Structural condition	Preliminary management recommendation	Years remaining	Category grading
T10	Cherry Prunus avium	9	26	N 5.0 S 5.0 E 2.5 W 3.5	1.5 first main limb at 1.5m high on west side	Ma	Fair	fair	Na	20 – 40	C3
T11	Walnut Juglans regia	5	11	N 2.3 S 0 E 1.8 W 1.5	1	y	Fair	Fair	Na	20-40	C/U
T12	*Rhus*	3.5	12	N 3.0 S 0 E 0 W 1.0	0.6	Ma	poor	poor	fell	<10	U
T13	*Sycamore* *acer psuedoplatanus*	10	25	N 3.5 S 3.5 E 3.5 W 3.5	3.5 first main limb at 3.5m high west side	em	Fair	fair	Na	20-40	C2
T14	*Purple hazel* *Corylus maxima purpurea*	6	10 x 5cm	N 5 S 2.5 E 2.5 W 3.5	0 first main limb at 1.5m high all side	Ma	good	fair	Na	20-40	C2,3

No.	Species English & Latin	Approx Height (M)	Dia. @1.5 (CM)	Spread (M)	Height Crown Clearance (m)	Age Class	Physiological condition	Structural condition	Preliminary management recommendation	Years remaining	Category grading
T15	*Sycamore* *Acer psuedoplatanus*	10	28	N 4.2 S 3.5 E 3.3 W 2.5	2 first main limb 2.2m high west side	em	Fair	fair potential weak fork at 1.1m high	Na	20-40	C2.3
T16	*Norway spruce* *Picea abies*	16	40	N 2.5 S 2.5 E 2.5 W 2.5	4.2 first main limb 4.2m high west side	Ma	Fair	fair	Na	20-40	B2
T17	*Norway spruce* *Picea abies*	16	30	N 2.5 S 2.5 E 2.5 W 2.5	1 first main limb 3m high west side	Ma	Fair	fair	Na	20-40	B2
T18	*Norway spruce* *Picea abies*	18	28	N 3.5 S 3.5 E 3.5 W 3.5	4.2 first main limb 4.2m high west side	Ma	Fair	fair	Na	20-40	B2
T19	*Norway spruce* *Picea abies*	16	13	N 2.5 S 2.5 E 2.5 W 2.5	3	y	Fair	fair	Na	20-40	B2

No.	Species English & Latin	Approx Height (M)	Dia. @1.5 (CM)	Spread (M)	Height Crown Clearance (m)	Age Class	Physiological condition	Structural condition	Preliminary management recommendation	Years remaining	Category grading
T20	*Norway spruce* *Picea abies*	18	32	N 3.5 S 3.5 E 2.5 W 2.5	4.2 first main limb 4.2m high west side	Ma	Fair	fair	Na	20-40	B2
T21	*Norway spruce* *Picea abies*	16	40	N 3.5 S 3.5 E 3.5 W 3.5		Ma	Fair	fair	Na	20-40	B2
T22	*Norway spruce* *Picea abies*	16	41	N 3.5 S 3.5 E 3.5 W 3.5	4.2 first main limb 4.2m high west side	Ma	Fair	fair	Na	20-40	B2
T23	*Eucalyptus*	20+	64 54	N 0 S 7.5 E 2.0 W 4.0	5 first main limb 5m high south side	om	fair	poor one sides crown as 2 limbs have been removed in the past. Weak fork at the base.	fell	<10	U
	High water demand species under NHBC guidance										

No.	Species English & Latin	Approx Height (M)	Dia. @1.5 (CM)	Spread (M)	Height Crown Clearance (m)	Age Class	Physiological condition	Structural condition	Preliminary management recommendation	Years remaining	Category grading
T24	*Oak* *Quercus robur*	9	39	N 5.5 S 5.5 E 5.5 W ?	2.2 first main limb at 3.2m high all sides	ma	good	fair	na	40	B23
	High water demand species under NHBC Guidance										
T25	*Rowan* *Sorbus aucuparia*	6	22	N 4.0 S 4.0 E 4.75 W 4.8	1 first main limb at 2m high east side	em	good	fair	na	20-40	C3
T26	*Sycamore* *acer psudoplatanus*	10	29	N 2 S 2 E 3 W 3	1 first main limb 4m high west side	em	fair	fair	na	20-40	C2
T27	*Oak* *Quercus robur*	12	40	N 2 S 6 E 0 W 6	0	ma	fair	fair leans west	na	40	B23
	High water demand species under NHBC guidance										
T28	*Oak* *Quercus robur*	12	54	N 7.5 S 7.8 E 9 W 8	2	ma	good	fair some najor dead wood in the crown	na	40	B23
	High water demand species under NHBC guidance										

No.	Species English & Latin	Approx Height (M)	Dia. @1.5 (CM)	Spread (M)	Height Crown Clearance (m)	Age Class	Physiological condition	Structural condition	Preliminary management recommendation	Years remaining	Category grading
T29	*Silver birch* *Betula pendula*	16	73	N 5.5 S 5.5 E 5.5 W 5.5	1.8	Ma	good	Good	na	20-40	B2
T30	*Silver birch* *Betula pendula*	6	18	N 2 S 2 E 3 W 2	1.5	y	fair	fair/poor	na	10-20	C/U
T31	*Silver birch* *Betula pendula*	16	73	N 4.5 S 4.5 E 6.5 W 6.0	1.5 first main limb 1.5m high west side	Ma	good	Good	na	20-40	B2
T32	*Purple hazel* *Corylus maxima purpurea*	4.5	15 x 5cm	N 4.5 S 4.5 E 4.5 W 4.5	0.5 first main limb at 1.5m high all sides	ma	good	good	na	20-40	C23
T33	*Cherry Plum* *Prunus cerasifera*	5.5	15 20 18	N 1 S 2 E 1 W 4.5	2	ma	fair/poor	fair/poor weak fork at 0.5m high	na	10	C/U

No.	Species English & Latin	Approx Height (M)	Dia. @1.5 (CM)	Spread (M)	Height Crown Clearance (m)	Age Class	Physiological condition	Structural condition	Preliminary management recommendation	Years remaining	Category grading
T34	*Hawthorn* *Crataegus monogyna*	5.5	24	N 4.5 S 2.5 E 4.5 W 1.5	1 first main limb at 2m high south side	em	fair	fair	na	20	C2,3
	High water demand species under NHBC guidance										
T35	*Horse chestnut* *Aesculus hippocastanum*	13	48	N 5 S 5 E 6 W 6	2 first main limb at 4.2m high west side	ma	fair	fair	na	40	B2
T36	*Apple* *Malus domestica cvr*	4	35	N 3 S 3 E 3 W 1	1	ma	fair	fair	na	10-20	C/U
	Limited amenity value in the wider landscape.										
T37	*Apple* *Malus domestica cvr*	2.2	34	N 3.7 S 3.5 E 3.2 W 2.5	1	ma	fair	fair	na	10-20	C/U
	Limited amenity value in the wider landscape.										

No.	Species English & Latin	Approx Height (M)	Dia. @1.5 (CM)	Spread (M)	Height Crown Clearance (m)	Age Class	Physiological condition	Structural condition	Preliminary management recommendation	Years remaining	Category grading
T38	*Apple* *Malus domestica*	2.2	31	N 3 S 3 E 3.5 W 0	1	ma	fair	fair	na	10-20	C/U
	Limited amenity value in the wider landscape.										
T39	*Plum* *Prunus domestica cvr*	2.2	34	N 3 S 2 E 2 W 2	1	ma	fair	fair	na	10-20	C/U
	Limited amenity value in the wider landscape.										
T40	*Pear* *Pyrus comnuis cvr*	2.2	14	N 2 S 2 E 2 W 2	2	ma	fair	fair	na	10-20	C/U
	Limited amenity value in the wider landscape.										
T41	*Norway spruce* *Picea abies*	16	35	N 3.25 S 3.25 E 3.25 W 3.25	1 first main limbs at 2.2m high on all sides	ma	fair	fair	na	20-40	B2
H1	*Native hedge*	2.5	av 20	as plan	0	ma	fair	fair	na	40	C2,3
	runs along the ditch line at the front of the site between the site and Rectory Lane, located to the road side of the ditch.										

7.0 Arboricultural Impact Assessment

7.1 The arboricultural impact is based on the following parameters.

- All trees that are to be retained will be protected by tree protection fencing in line with BS5837:2012 section 6.2
- Should be read in conjunction in Tree Constraints and Protection Plan drawing number HGN/RL/01.

7.2 The root protection area (RPA) is an area of ground around the tree that should be retained, undisturbed, for the benefit of the tree roots. The RPA is calculated, as set out in BS5837:2012. This determines the square metres of ground area that should be retained. This is often shown as a circle, with a radius as determined by the calculation. However, it is not always essential that this is a circle, and, in some situations, the geography of the site can make an alternative shape more appropriate. It must still equate to the same area as the circle calculated under the approved calculation.

Tree no.		RPA m/sq	Radi of RPA (M)	Tree implications assessment	Mitigation
T1	*Oak*	707	15.0	**Crown** The buildings are ell outside the crown spread **Roots** The buildings are well outside the root zone. However, a section of the road will run over the root area.	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01. The section of road within the root zone will be a no-dig construction with a porous finish see section 7.5 below.
H1	*Mixed native hedge*		2.5	A section will need to be removed to create the new access road	The remaining hedge will be retained and form a screen between the site and the road.
T2	*Lime*	41	3.6	Remove to facilitate the development	
T3	*Sycamore cvr*	10	1.8	Remove to facilitate the development.	small tree with limited value in the wider landscape.
T4	*Norway spruce*	28	3.0	U rated remove	

T5	*Cherry*	5	1.2	U rated remove	
T6	*field maple*	10	1.8	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T7	*Cherry*	14	2.1	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T8	*Oak*	366	10.8	**Crown** The buildings are ell outside the crown spread. **Roots** The buildings are well outside the root zone. However, a section of the road will run over the root area.	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01. The section of road within the root zone will be a no-dig construction with a porous finish see section 7.5 below.
T9	*Norway spruce*	14	2.1	U rated remove	
T10	*Cherry*	28	3.0	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T11	*Walnut*	5	1.2	U rated remove	
T12	*Rhus*	7	1.5	U rated remove	
T13	*Sycamore*	28	3.0	Remove to facilitate the development.	
T14	*Purple hazel*	11	1.9	Remove to facilitate the development.	
T15	*Sycamore*	34	3.3	Remove to facilitate the development.	

T16	*Norway spruce*	72	4.8	Remove to facilitate the development.	
T17	*Norway spruce*	41	3.6	Remove to facilitate the development.	
T18	*Norway spruce*	34	3.3	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T19	*Norway spruce*	10	1.8	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T20	*Norway spruce*	48	3.9	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T21	*Norway spruce*	72	4.8	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T22	*Norway spruce*	72	4.8	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T23	*Eucalyptus*	317	10.0	U rated remove	
T24	*Oak*	72	4.8	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T25	*Rowan*	23	2.7	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01

T26	*Sycamore*	41	3.6	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T27	*Oak*	72	4.8	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T28	*Oak*	137	6.6	**Crown** The building will be within the crown spread of the tree. **Roots** The building is outside the root zone of the tree.	**Crown** Reduce the crown by 2m on the house side. This will also balance the crown. **Roots** Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T29	*Silver birch*	238	8.7	**Crown** the building is outside the crown spread of the tree. **Roots** the new building encroaches into the edge of the root zone. It will impact on approximately 3 msq Access will be required over part of the root area to facilitate the build.	**Crown** Raise the crown to 3.5m high to allow light into the garden Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01 **Roots** the area of root zone over which access is required will be protected for the duration of the build with additional ground protection in line with BS5837 see section 7.4 below and drawing HGN/RL/01.
T30	*Silver birch*	14	2.1	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01

T31	*Silver birch*	238	8.7	**Crown** the building is outside the crown spread of the tree. **Roots** the new building encroaches into the edge of the root zone. It will impact on approximately 3 msq Access will be required over part of the root area to facilitate the build.	**Crown** Raise the crown to 3.5m high to allow light into the garden Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01 **Roots** the area of root zone over which access is required will be protected for the duration of the build with additional ground protection in line with BS5837 see section 7.4 below and drawing HGN/RL/01.
T32	*Purple hazel*	17	2.3	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T33	*Cherry plum*	43	3.7	U rated remove	
T34	*Hawthorn*	28	3.0	Remove to facilitate the development	small tree with limited value in the wider landscape.
T35	*Horse chestnut*	102	5.7	Distant enough from the proposals not to be affected	Protect with an exclusion zone for the duration of the build, enclosed with tree protection fencing in line with BS5837 appendix 1 of this report and drawing HGN/RL/01
T36	*Apple*	41	3.6	Remove to facilitate the development	small tree with limited value in the wider landscape.
T37	*Apple*	55	4.2	Remove to facilitate the development	small tree with limited value in the wider landscape.
T38	*Apple*	41	3.6	Remove to facilitate the development	small tree with limited value in the wider landscape.
T39	*Plum*	55$.2		Remove to facilitate the development	small tree with limited value in the wider landscape.

T40	*Pear*	10	1.8	Remove to facilitate the development	small tree with limited value in the wider landscape.
T41	*Norway spruce*	55	4.2	Remove to facilitate the development	

7.3 Tree protection fencing

The root protection areas (RPA) of retained trees should be protected for the duration of the works with tree protection fencing, in line with BS5837:2012, prior to the developer commencing on site. The fencing is to be of 1.8m steel mesh, heras fencing, to be installed as detailed in BS5837:2012 section 6.3.2 figure 3. (See appendix 1). Once erected, the fencing will have all weather notices attached to the barrier worded "Construction Exclusion Zone –Keep out". The fencing should not be taken down until all construction and any hard surfaces is completed, see appendix 1

7.4 Additional ground protection

Where access is required over an RPA to facilitate the build, additional ground protection in line with BS5837:2012. This should be as follows: For pedestrian access only, a single thickness of scaffold board either, suspended on a driven scaffold frame to form a suspended walkway, or on a non-compressible layer (e.g. 100mm layer of bark mulch) laid over a geotextile.

For pedestrian operated plant, up to a gross weight of 2t, proprietary inter linked ground protection boards, placed on a non-compressible layer (e.g. 100mm layer of bark mulch) laid over a geotextile.

For wheeled or tracked plant over 2t in gross weight, an alternative system (e.g. proprietary system or pre-cast reinforced concrete slabs) to an engineering specification, designed to accommodate the likely load it will be subject to, is required.

7.5 New hard surface

Any new hard surface within the root zone should also be a no-dig construction. They should be designed by the architect or engineer to comply with the following within the RPA of the retained trees.

Any grass sward is to be removed by hand. A geotextile will be laid over the surface of the soil, at the existing level. Any low areas should be built up using sharp sand. There should be no excavation into the soil within the root protection area. A cellular sub base,

such as of cellweb, or similar, root protection system, should be laid over the area. This should be filled with granite chips with no fines. This should not be tipped within the root area and should be spread from one end, by hand. The edgings are to be a timber board held in place with timber pegs, so that the roots are not damaged. The surface finish will be a porous finish, allowing water and air to percolate through the joints.

7.6 Service runs

Any Utilities trenches should where possible avoid the RPA's of retained trees. If a service route cannot avoid the RPA of a retained tree, it should be installed in one of the following two ways, to avoid excavation with machinery in the RPA or precautionary area:

For short runs, the service trench will be carefully excavated by hand. Any roots over 25mm will be retained and protected by wrapping in damp Hessian. Any roots less than 25mm in diameter, which cannot be preserved, will be pruned cleanly with a sharp saw or secateurs or hand saw, by a suitably qualified person. Exposed roots will be covered with damp Hessian and sharp sand. Back fill is to be of excavated soil or an inert granular fill.

For long runs, a trenchless installation method, such as directional drilling or impact moling, is to be used. Retrieval and access chambers should be located outside the RPA of the trees.

The works should comply with current safety practices for excavating trenches.

7.7 Footings

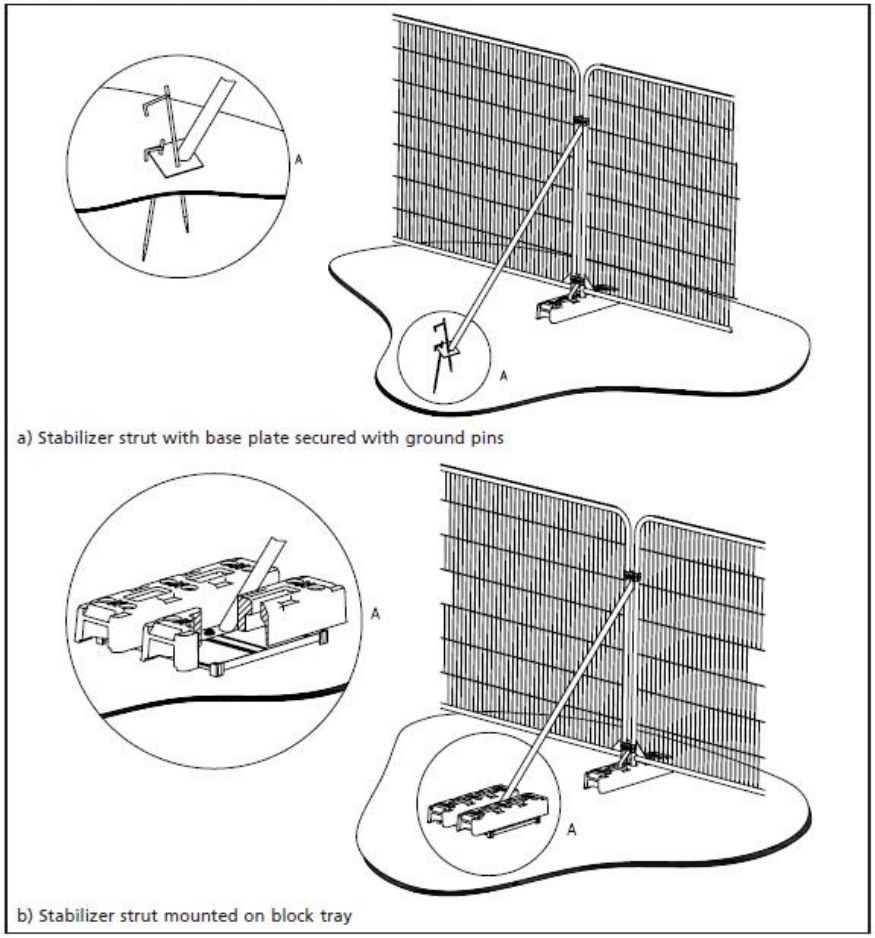
Ideally there should be no construction within the root protection area. However where the proposed structure encroaches into the root protection areas (RPA) of retained tree the footings should adhere to the following in line with BS5837:2012. For encroachment into the root area (RPA) of retained tree this recommends that root damage is minimised by using a piled footing. Site investigation should be carried out by hand or with compressed air tools, to determine the location of the piles, to avoid roots important for the structural stability of the tree. The piling machine will be the smallest practicable machine and will work off ground protection piling mats. It will be lowered when manoeuvring between piling operations when close to the crown of the tree.

The beams should be laid at or above ground level and cantilevered as necessary to avoid roots identified by the site investigation to minimise disturbance into the root zone.

7.8 There will no changes in ground levels, within the root area of any retained tree.

Appendix 1 – Protective fencing

Figure 3 **Examples of above-ground stabilizing systems**



Tree protection fencing should be installed in the position as shown in the tree constraints and protection plan for the site.


PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.


TREE PROTECTION AREA
KEEP OUT !
(TOWN & COUNTRY PLANNING ACT 1990)
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A TREE PRESERVATION ORDER.
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION
ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

Appendix 2 – Temporary ground protection

If the drive is removed the root area within it, shown on drawing MP/60ER/01, will be protected using additional ground protection, prior to commencing building and demolition works.
This will protect the roots, and the soil around them, from damage by compaction, spillage and excavation.

For pedestrian access, only, a single thickness of scaffold board either suspended on a driven scaffold frame to form a suspended walkway, or on a non compressible layer (eg 100mm layer of bark mulch) laid over a geotextile.

For pedestrian operated plant, up to a gross weight of 2 ton, proprietary inter linked ground protection boards, placed on a non compressible layer (e.g. 100mm layer of bark mulch) laid over a geotextile.

For wheeled or tracked plant over 2 ton is gross weight, an alternative system (e.g. proprietary system or pre-cast reinforced concrete slabs) to an engineering specification designed to accommodate the likely load it will be subject to.

Appendix 3 – Report Caveats

1. The report is based on a ground level visual tree assessment (Mattheck).
2. No soil samples were taken for testing. If Soil analysis is required a soil engineer should be employed.
3. No pest and disease samples were taken or sent away for analysis.
4. It remains the responsibility of the tree owner to check TPO status prior to carrying out any works on the tree.
5. Physiological and structural assessments are valid for a period of 12 months. It is an external inspection only.
6. VTA of the tree was assessed only on date of inspection; it remains valid only if no environmental changes around the tree. If any changes should occur re-inspection should be carried out.
7. Environmental changes around the tree will render the report invalid.
8. No internal diagnostic equipment was used.
9. Any works to the trees should comply with BS3998:2010 Tree Work

Appendix 4 – References

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

NHBC Chapter 4.2 Building near trees

D Lonsdale 'Principles of Tree Hazard Assessment and Management'
Forestry Commission 2007

Strouts and Winter 'Diagnosis of ill health in trees'
Forestry Commission 2007

C Mattheck and H Breloer 'Body Language of Trees'