



# Pre-development Arboricultural Survey and Report

---

Land at 4 Frognal Close, Hampstead London NW3 6YB

A report to: George Kounnou of GCK Architects Ltd.

Date: 2nd October 2015

Report No: WAS13-2015-Rev1

## Table of Contents

Report Verification.....	4
Disclaimer.....	4
Validity of Data.....	4
Introduction and Scope of Report.....	5
Abbreviations: .....	5
Arboricultural Impact Assessment .....	6
Proximity of Proposed Development to existing Trees.....	6
Arboricultural Method Statement (Provisional) .....	7
Excavation within RPA of Retained Trees .....	7
Tree Protection Barriers & Construction Exclusion Zone.....	7
Ground Protection of Existing Surfaces within Root Protection Area (RPA) of Nearby Trees .....	7
Access Facilitation Pruning & Tree Works.....	7
Site Access and Construction Working Area (CWA).....	7
Site Storage and Accommodation.....	7
Installation of Services .....	8
Arboricultural Supervision (AS) .....	8
Conclusion .....	8
Tree Grading Categories.....	9
Trees categorized within this report: .....	9
Trees for removal on this site:.....	9
References.....	11
Declaration .....	11
Addendum 1 – Tree Protection .....	12
Table 1 -Tree protection measurements .....	12
Protecting Root Zone of Trees (BS 5837:2012 section 6.2 Figs. 2 & 3):.....	12
The Root Protection Area (RPA).....	12
Key Points .....	13
Excavation within Root Protection Area of trees.....	13
Site Hoarding .....	14
Ground Protection System Specification: .....	14
Addendum 2 – Tree Works.....	15

**Office:** 15 Norcombe House, Wedmore St., Islington N19 4RD

**Tel:** 07860 445380

**Email:** [office@wassells.co.uk](mailto:office@wassells.co.uk)

[www.wassells.co.uk](http://www.wassells.co.uk)

Schedule of Tree Works ..... 15

    Trees and vegetation recommended for removal: ..... 15

    Recommended work for trees being retained: ..... 15

Addendum 3 - Schedule of Tree Survey Information – BS5837:2012 section 4.4 ..... 16

    TREE SURVEY KEY: ..... 18

Addendum 4 – Tree Protection Barriers and Tree Care Flow Chart ..... 19

Addendum 5 – Plans and Picture Gallery ..... 23

## Report Verification

This study has been undertaken in accordance with British Standard 5837:2012 “Trees in relation to design, demolition and construction - Recommendations”.

## Disclaimer

The contents of this report are the responsibility of Wassells Arboricultural Services Ltd. It should be noted that, whilst every effort is made to meet the client’s brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Wassells Arboricultural Services Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

## Validity of Data

The findings of this study are valid for a period of 12 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified and experienced arboriculturist to assess any changes to the trees and groups on site and to inform a review of the conclusions and recommendations made.

It should be noted that trees are dynamic living organisms that are subject to natural changes as they age or are influenced by changes in their environment. As such following any significant meteorological event or changes in the growing environment of the trees they should be re-assessed by a suitably qualified and experienced arboriculturist.

## Introduction and Scope of Report

This document has been produced to provide a detailed survey of trees that could be affected by the proposed development and that are within, surrounding and nearby to this report site demise.

The scope of this report follows the recommendations and guidance described within **BS 5837: 2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*** which sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.

The report will assess the quality, amenity and landscape value of all surveyed trees as described by the tree category system within BS 5837 (see section below).

The protection of all trees to be retained and where they are likely to be affected by the proposed development construction activities are described as a provisional AMS for information purposes only and shall require a site specific AMS once final plan are agreed.

The report will also indicate, where necessary, the likely impact the proposals may have on those trees in the future.

The report will also recommend any required tree works to enable access and also to mitigate potential damage from construction activity and for the future well being of the trees concerned.

This is intended to support the planning application for development of this site.

The tree survey for the site can be found in Addendum 3 below

### Abbreviations:

RPA = root protection area

CEZ = construction exclusion zone

CWA = construction working area (including materials storage)

AMS = arboricultural method statement

## Arboricultural Impact Assessment

### Proximity of Proposed Development to existing Trees

**Ref: Addendum 1 -Table 1, Addendum 3**

**All trees in or near the above site have been surveyed and that information is shown in addendum 3 below.**

This site has a small garden that has become overgrown and is well stocked with trees. There are 5 trees that are growing very close along the side boundary and within the rear garden of 42 Frognal Lane that overhang and touch the property in 4 Frognal Close. All of these trees are of low amenity and act as primarily screening to the boundary of the site.

There is a substantial Gum Tree (T1) within the rear garden, which is of reasonable quality and amenity value but shall require crown reduction to prevent over-dominance of this small garden.

None of the trees within the garden shall be impacted by the proposed development but will require suitable protection with appropriate tree barrier to prevent damage from construction activity.

The trees along the side boundary and within rear garden of 42 Frognal Lane are unlikely to be impacted by the proposed development but the considerable overhang of branches will need to be reduced, considerably. These trees are growing in ground that is at a higher level than in 4 Frognal Close and retained by a wall of around 1 metre in height, which is likely to off-set the typical rooting area for these trees. The proposed groundfloor footprint does extend slightly further towards this boundary than the existing. However, because of the level difference there is not likely to be an impact on them.

The Lime tree T4 is probably closest to the proposed extension to the rear but will not be impacted by the proposed development. The RPA of this tree will require ground protection to prevent compaction from construction activity.

All trees surveyed are proposed for retention as part of this application.

## Arboricultural Method Statement (Provisional)

Ref: Addendum 1 & 2

**\*\* This method statement shall be seen as provisional for planning purposes and subject to a detailed follow up submission and construction plan once proposals are agreed and to conform to any specific planning conditions made \*\***

### Excavation within RPA of Retained Trees

Ref: Addendum 1

**\* Please see addendum 1 section on Excavation within RPA of retained trees.**

None proposed but slight possibility along NW boundary.

### Tree Protection Barriers & Construction Exclusion Zone

**\*Please see specification for tree protection barriers shown below**

Tree protection to be as figure 3 in addendum 4 below

Line of barrier to be agreed as site specific AMS within construction plan when written

### Ground Protection of Existing Surfaces within Root Protection Area (RPA) of Nearby Trees

Ref: Addendum 1

**\* Please see addendum 1 section on Ground Protection System**

Ground protection required for RPA of Lime tree T4 and agreed as part of construction plan when written

### Access Facilitation Pruning & Tree Works

Ref: Addendum 2

Recommended tree works are shown in the end column of addendum 3 below

### Site Access and Construction Working Area (CWA)

Not known – part of construction plan

### Site Storage and Accommodation

Not known – part of construction plan

**Office:** 15 Norcombe House, Wedmore St., Islington N19 4RD

**Tel:** 07860 445380

**Email:** [office@wassells.co.uk](mailto:office@wassells.co.uk)

[www.wassells.co.uk](http://www.wassells.co.uk)

## Installation of Services

Arrangements for this element of the development of the site are unknown as at time of writing this report but are likely to remain as existing.

Changes to the service routes will be carefully considered using the AS below to advise on protection of nearby trees prior to commencement on site.

## Arboricultural Supervision (AS)

AS shall be required during work within and adjacent to the RPA of retained trees. It must be undertaken at regular intervals with a written record of the meetings maintained with suitable photographic record in support.

The AS must include a pre-construction commencement site visit, to be arranged by the Site Manager under instruction from Architects, and thereafter at specific events that affect the retained trees on site to enable sign-off by the AS. These are typically as follows:

1. Erection of tree protection fencing
2. Installation of ground protection to retained trees whose RPA are affected by the CWA
3. Start of Excavation/piling of foundations within the RPA of retained trees
4. Tree pruning requirements to prevent crown damage from construction activity
5. Start of Excavation/installation of paths, roads and car parking within RPA of retained trees
6. Installation of underground services within the RPA of retained trees
7. Tree condition survey on completion of construction work

## Conclusion

Provided the recommendations shown above and the methodology for protection of any retained trees are followed, there will not be an effect on the current or future condition of those trees that are retained as part of the proposed scheme.



## Tree Grading Categories

**Ref: Grading Category as per BS 5837:2012 Section 4.5 Table 1 & Table 2 – Tree quality assessment chart.**  
**Tree Survey Schedule in Addendum3 below for description of trees categorized**

The grading categories are based on the following criteria:

A= those trees of high quality and value with an estimated life expectancy of at least 40 years

B= those trees of moderate quality and value with an estimated life expectancy of at least 20 years

C= those trees of low quality with an estimated life expectancy of at least 10 years or with a stem diameter of less than 150mm

U=trees of such a condition that they cannot realistically be retained as living trees in the context of the current land use

Categories A, B and C have further sub-categories with regards to the reasons for tree retention as follows:

- 1: Mainly arboricultural qualities.
- 2: Mainly landscape qualities.
- 3: Mainly cultural values, including conservation.

### Trees categorized within this report:

- 1 Category A trees = None
- 2 Category B trees = T1, T3 & T5
- 3 Category C trees = T4, T8 & T9
- 4 Category U trees = T6

### Trees for removal on this site:

NONE

## Age Categories and Distribution

Those trees assessed as being young (Y) in age can generally be considered to have significant growth potential. Whilst these specimens are not likely to make a substantial contribution to the landscape character of the site at present they will, if retained, provide succession for the eventual removal of mature or over-mature trees as a result of declining physiological or structural condition.

Semi mature trees (SM) will generally make a significant contribution to the landscape character and appearance of the site and their retention will provide more immediate succession. These trees will also have significant growth potential.

Mature trees (M) are not considered to have significant future growth potential and have generally reached their maximum expected size for the location. These trees will generally make the highest contribution to the landscape contribution of the site however a tree stock over dominated by mature trees will require careful management to ensure that continuation of canopy cover can be achieved.

Over-mature trees (OM) do not have the potential to increase in size and may in fact reduce in size as their crowns begin to break up. These trees will often make a significant contribution to the landscape character of the site and are likely to have ecological value. However the retention of these trees within new development must be carefully planned as they are approaching the end of their useful life expectancy and they will often have structural defects. Where over-mature trees are to be retained in new development it is essential that access is available for their eventual removal.

Veteran trees (V) are those that show features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species. These trees have negligible potential to increase in size. Veteran trees are usually of a high ecological value and they will require sensitive management where they are to be retained in new development. As such it is again essential that they are located in areas where access is available to undertake management operations and where there is a reduced risk of harm occurring from failure of the trees.

## References

1. BS 5837:2012 Trees in Relation to Design, Demolition and Construction - Recommendations
2. BS3998:2010 Tree Work – Recommendations
3. NJUG Volume 4 Issue2 2007 – Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees.
4. NHBC Standards – Section 4.2 Building Near Trees
5. British Geological Survey – London & the Thames Valley
6. Principles of Tree Hazard Assessment – Lonsdale 2001
7. Diagnosis of Ill Health in Trees – Stouts & Winter 2004
8. Tree Survey Plan – at end of report
9. Existing and proposed plans – GCK Architects existing and proposed drawings L(PL)4FRG

## Declaration

This Tree Survey, Impact Assessment and provisional AMS have been written and checked by Richard Wassell of Wassells Arboricultural Services Ltd. and are provided without prejudice as an objective and professional assessment of the trees described.

Signed: *R.J. Wassell* Date: *02.10.MMXV*

**Richard Wassell. Director**

**MCIHort MARborA NDArb (RFS) Kew Diploma NEBOSHlevel3**

## Addendum 1 – Tree Protection

Ref: BS 5837:2012 in Tables C.1 & D.1 of annex C & D

**Table 1 -Tree protection measurements**

Tree Number  As per tree survey plan & schedule	Stem Diameter @ 1.5 metres agl.  Millimetres	Root Protection Area (RPA) - Radius  *measured from centre of stem*  Metres	Tree/Root Protection Area (RPA)  Sq. Metres	Affect of building proposal on the total RPA
T1	725	8.7	238	Typical RPA not impacted by the proposed new building
T2	2 x 100	1.4	7	Typical RPA not impacted by the proposed new building
T3	175  75	2.5	18	Typical RPA not impacted by the proposed new building
T4	450 #	5.4	92	Typical RPA not impacted by the proposed new building
T5	175	2.1	14	Typical RPA not impacted by the proposed new building
T6		N/A		RPA not impacted due to the condition/state of this tree
T7	325	3.9	48	Typical RPA not impacted by the proposed new building
T8	2 x 200 #	2.7	23	Typical RPA not impacted by the proposed new building
T9	150 #  225 #	2.8	23	Typical RPA not impacted by the proposed new building
T10	125	1.5	7	Typical RPA not impacted by the proposed new building
T11	175	2.1	14	Typical RPA not impacted by the proposed new building

### Protecting Root Zone of Trees (BS 5837:2012 section 6.2 Figs. 2 & 3):

#### The Root Protection Area (RPA)

This is the area surrounding a tree that is deemed to contain sufficient roots and rooting volume to maintain the trees viability in the future. The root system is typically concentrated in the uppermost 600 – 1200mm of the soil and is not necessarily symmetrical around the tree, being dependant on a number

**Office:** 15 Norcombe House, Wedmore St., Islington N19 4RD

**Tel:** 07860 445380

**Email:** office@wassells.co.uk

[www.wassells.co.uk](http://www.wassells.co.uk)

of factors such as water, nutrients, oxygen, soil penetrability and physical obstructions such as existing foundations or changes in level (terracing).

The RPA is a design layout tool that is deemed to be a minimum area around a tree where the protection of roots and soil structure are treated as a priority. This area is envisaged as and portrayed with a circle around each tree but where there appears to be restrictions to root growth the circle is reshaped to reflect more accurately the likely distribution of the rooting area of the tree concerned.

### Key Points

1. AVOID building works within the RPA if at all possible but if not then carefully consider the following: where the RPA is likely to be severely affected because of site design constraints then felling and planting replacement(s) trees in a more suitable location on the site will need to be considered.
2. Where possible do not use strip foundations within the RPA, if absolutely necessary consider using a trenching saw or excavate by hand to avoid 'shatter damage' to the root system.
3. Consider using piling techniques for foundations @ maximum 350 mm diameter with ground beams on or above the surface of the root zone.
4. Unless unavoidable, do not exceed entering the root zone by more than one fifth of RPA radius.
5. Do not trench tangentially across the root zone for footings and services unless it cannot be avoided.
6. Consider 'no dig' techniques for services installation, with radial service lines being preferable to tangential across the root zone. Where this is undertaken then boring must be carried out below 600mm deep.
7. Any hard surfacing, paths and roads need to have the same considerations for the RPA and as in the above points. Where possible paths and hard surfacing (patios etc) need to be surface constructed (cellular) and semi-porous to allow water penetration and gaseous exchange into the root system of trees.

### Excavation within Root Protection Area of trees

Where trees are to be retained then any proposed foundation, underground services work and hard surfacing such as roads/paths falling within the RPA of trees that are to be retained shall be kept as far away from tree stems as possible (SEE NOTE 1 ABOVE). Where any such works are necessary within the RPA there will be a requirement to dig carefully by hand and ensure any roots encountered of maximum 25mm in diameter shall be exposed and correctly pruned back by a competent Arborist. Where larger roots are encountered of above 25mm in diameter then advice from the Arboricultural Supervisor (AS) for the site must be sought prior to any work being undertaken.

**Any roots exposed/ pruned back as part of the above operation shall NOT be left exposed to drying out. All roots exposed/pruned shall be either covered with damp Hessian sacking prior to backfill or backfilled/covered immediately with a suitable open and free draining compost/loam.**

### Site Hoarding

Site hoarding shall be no closer than 1.5 metres away from the stem of retained trees and consist of 20mm plywood sheets supported by minimum 100mm square posts and 100 x 50mm rails with posts at 2.5 metre centres.

Post holes for site hoarding that are required within the RPA of nearby trees shall be dug by hand and are to be a maximum of 300 x 300mm and 450mm deep

### Ground Protection System Specification:

- Level area of RPA concerned by blinding with sharp sand at maximum depth of 50mm
- Lay geo-textile membrane such as 'Terram' to cover area concerned
- Cover geo-textile with maximum of 100mm MOT Type 1 sub-base
- Retain MOT type 1 with edge restraint such as 30 x 100mm edging board pegged every 2 metres to prevent migration of the sub-base

## Addendum 2 – Tree Works

Ref: Addendum 3

### Schedule of Tree Works

#### Trees and vegetation recommended for removal:

None

#### Recommended work for trees being retained:

See recommendations of tree survey information in Addendum 3 below

Tree work to be carried out to the following standards and guidelines:

1. BS 3998:2010 Recommendations for Tree Work
2. Tree pruning cuts will be carried out using the 'Natural Target Pruning' technique as defined by: *BS 3998:2010 section 7.2.5 and Fig. 2 The Pruning of Trees, Shrubs and Conifers: George E. Brown & Tony Kirkham – 2<sup>nd</sup> edition revised & enlarged 2004 and Section 3.1.27 of The Arboricultural Association Specification for Tree Works June 2008.*
3. Crown clean involves removal of dead, diseased & dying wood from tree crown, thinning of overcrowded crown, and removal of ivy and all epicormic growth within crown including stem & basal epicormic growth.

**Office:** 15 Norcombe House, Wedmore St., Islington N19 4RD

**Tel:** 07860 445380

**Email:** [office@wassells.co.uk](mailto:office@wassells.co.uk)

[www.wassells.co.uk](http://www.wassells.co.uk)

### Addendum 3 - Schedule of Tree Survey Information – BS5837:2012 section 4.4

**SITE:** 4 Frognal Close, NW3 6YB **DATE:** 7<sup>th</sup> August 2015

Tree Number	Species	Diameter Class mm	RPA radius metres	Height metres	Crown Spread metres	Crown height	Age Class	Grading Category	Estimated Future Lifespan	Structure	Physiology, Condition & other factors	Management recommendation
T1	Eucalyptus	725	8.7	18	N=7 S=7 E=7 W=7	MEDIUM	M	B2	40+	M/G	A Small basal scar on house side. Several broken out branches hung-up within the crown	LC 5M. RC2M. CC.
T2	Magnolia	2 x 100	1.4	4	N=1 S=2 E=2 W=1	LOW	SM	NG		M	A Twin stem from base	N
T3	Persian Ironwood	175 75	2.5	4	N=2 S=3 E=3 W=1	LOW	SM	B1	40+	M	A Twin stem from base Not common but interesting species	N
T4	Common Lime NDG	450 #	5.4	12	N=4 S=4 E=4 W=4	LOW	M	C2	20-40	M	A Ivy clad TO top of crown. Previously crown reduced. Low quality tree	N
T5	Katsura Tree	175	2.1	8	N=2 S=3 E=1 W=2	LOW	SM	B1	20-40	G	AA Not common but interesting species Good specimen	N
T6	Horse Chestnut NDG		N/A	4	Interlocked with T11	LOW	OM	U		P	D. Truncated at 4 metres with horizontal branches growing into property. Bad Leaf Miner and Leaf Blight. Very poor specimen Potential decay in truncated stem? Level difference of 0.75 to 1 metre higher than number 4	OVERHANG - RC2M

**Office:** 15 Norcombe House, Wedmore St., Islington N19 4RD

**Tel:** 07860 445380

**Email:** office@wassells.co.uk

[www.wassells.co.uk](http://www.wassells.co.uk)



Tree Number	Species	Diameter Class mm	RPA radius metres	Height metres	Crown Spread metres	Crown height	Age Class	Grading Category	Estimated Future Lifespan	Structure	Physiology, Condition & other factors	Management recommendation
T7	Leyland Cypress NDG	325	3.9	12	Interlocked with T11 and T8	LOW	SM	NG			A Twin stem from 2 metres and previously topped Poor specimen Level difference of 0.75 to 1 metre higher than number 4	N
T8	Fastigiate Hornbeam NDG	2 x 200 #	2.7	12	Interlocked with T7 and T9	LOW	SM	C2	20-40	M	A Twin stem from close to base with branches touching the property Level difference of 0.75 to 1 metre higher than number 4	OVERHANG - RC2M
T9	Fastigiate Hornbeam NDG	150 # 225 #	2.8	12	Interlocked with T8	LOW	SM	C2	20-40	M	A Twin stem from close to base with branches touching the property Level difference of 0.75 to 1 metre higher than number 4	OVERHANG - RC2M
T10	Holly	125	1.5	5	N=1 S=1 E=1 W=1		SM	NG			A Drawn up crown due to location	N
T11	Eucalyptus NDG	175	2.1	12	Interlocked with T6 and T7		Y	NG			A Drawn up crown due to location Level difference of 0.75 to 1 metre higher than number 4	N

**Office:** 15 Norcombe House, Wedmore St., Islington N19 4RD

**Tel:** 07860 445380

**Email:** [office@wassells.co.uk](mailto:office@wassells.co.uk)

[www.wassells.co.uk](http://www.wassells.co.uk)

## TREE SURVEY KEY:

**Tree Number and Species** = number of tree on plan and Common Name/botanical name

**Height** = estimated height of tree from surrounding ground level +/- 3 metres

**Diameter Class** = diameter of main stem @ 1.5 metres above ground level

**Crown Spread** = maximum extent of branches measured radially from the base of the tree, trees with asymmetrical crowns are shown with distances in relation to compass points. N = north etc.

**Crown Height** = height of canopy and/or first major branch above ground level. Low (L) = below 3 metres | Medium (M) = 3 to 6 metres | High (H) = above 6 metres

**Age Class** = Young(Y): age less than 1/3<sup>rd</sup> life expectancy | Semi-mature(SM): 1/3<sup>rd</sup> to 2/3<sup>rd</sup> life expectancy | Mature (M): Over 2/3<sup>rd</sup> life expectancy | Over mature (OM): mature and in state of decline | Veteran (V):

Surviving beyond typical age range for species

**Grading Category:** As per BS 5837:2005 Table 1 – Tree quality assessment, which refers to tree quality and landscape/amenity value; A=high, B=moderate, C=low, NG= not graded

**Estimated Future Lifespan** = estimated useful and remaining contribution to the site in years - <10, 10-20, 20-40 & >40

**Structure** = structural condition of the tree based on roots, trunk, and major stems/branches along with the presence of any structural defects and decay organisms. Categories are: Very Good (VG); Good (G); Moderate (M); Poor (P); Hazardous (H)

**Physiology/Condition** = Overall health, condition and function of the tree in comparison to a 'normal' specimen of its species and age. Categories are: Above average (AA); Average (A); Declining (D)

**Other factors** = any other physical/environmental factors that could influence the tree now/in the future

**Management Recommendations:** **N** = no work required. **CC** = removal of dead, diseased & dying wood from tree crown, thinning of overcrowded crown, removal of Ivy from crown & stem and removal of all epicormic growth within crown including stem & basal epicormic growth on Lime trees. **LC** = lift crown. **TC** = thin crown. **RC** = reduce crown. **P** = pollard. **SP** = scaffold pollard. **RE** = remove epicormic and basal growth. **FP** =

Formative prune **F** = fell to ground level. **FG** = fell and grind out stump. **R** = carry out replacement planting. **AI** = 3 yearly Arboricultural inspection

**RPA radius** = radius of typical root protection area, described as a circle and measured around centre of the tree

**N/K** = not known

**#** = estimated data

**NDG** = Next door garden

**g.l.** = ground level

**Alan Mitchell System** = Estimate of tree age based on open grown tree with full crown. Age in years = Girth (circumference) in centimetres measured at 1.5 metres above ground level and divided by 2.5 i.e. Tree of girth 250 cm = 100years old

**Office:** 15 Norcombe House, Wedmore St., Islington N19 4RD

**Tel:** 07860 445380

**Email:** office@wassells.co.uk

[www.wassells.co.uk](http://www.wassells.co.uk)

## **Addendum 4 – Tree Protection Barriers and Tree Care Flow Chart**

6.2.2.4 All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE – NO ACCESS".

Figure 2 Default specification for protective barrier

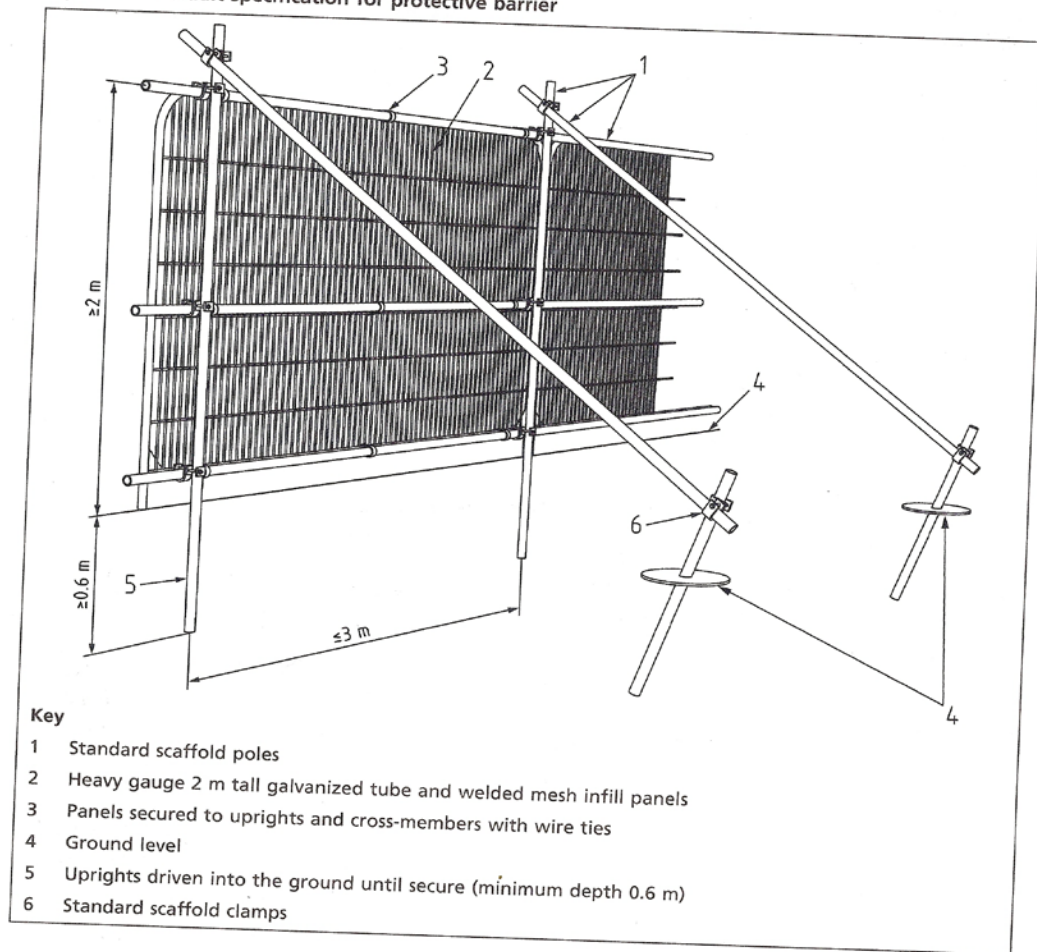


Figure 3 Examples of above-ground stabilizing systems

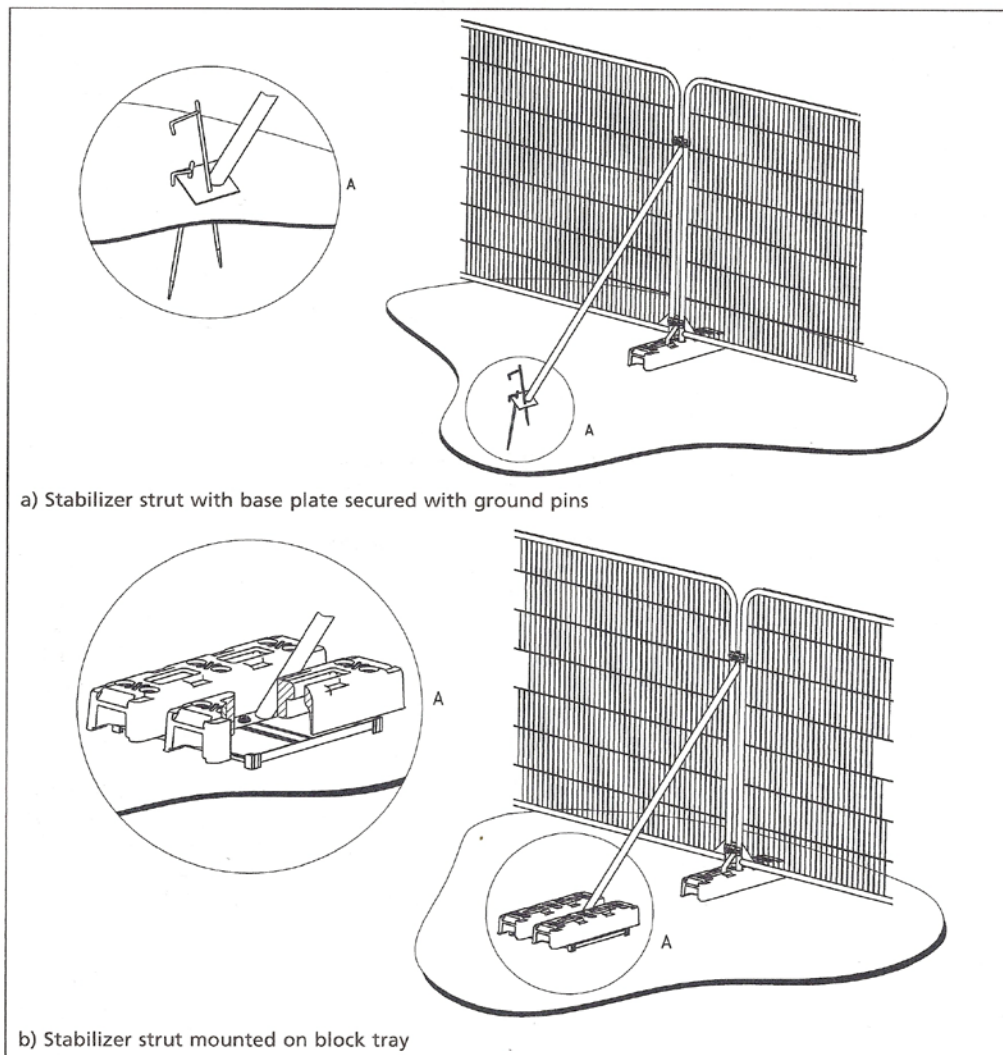
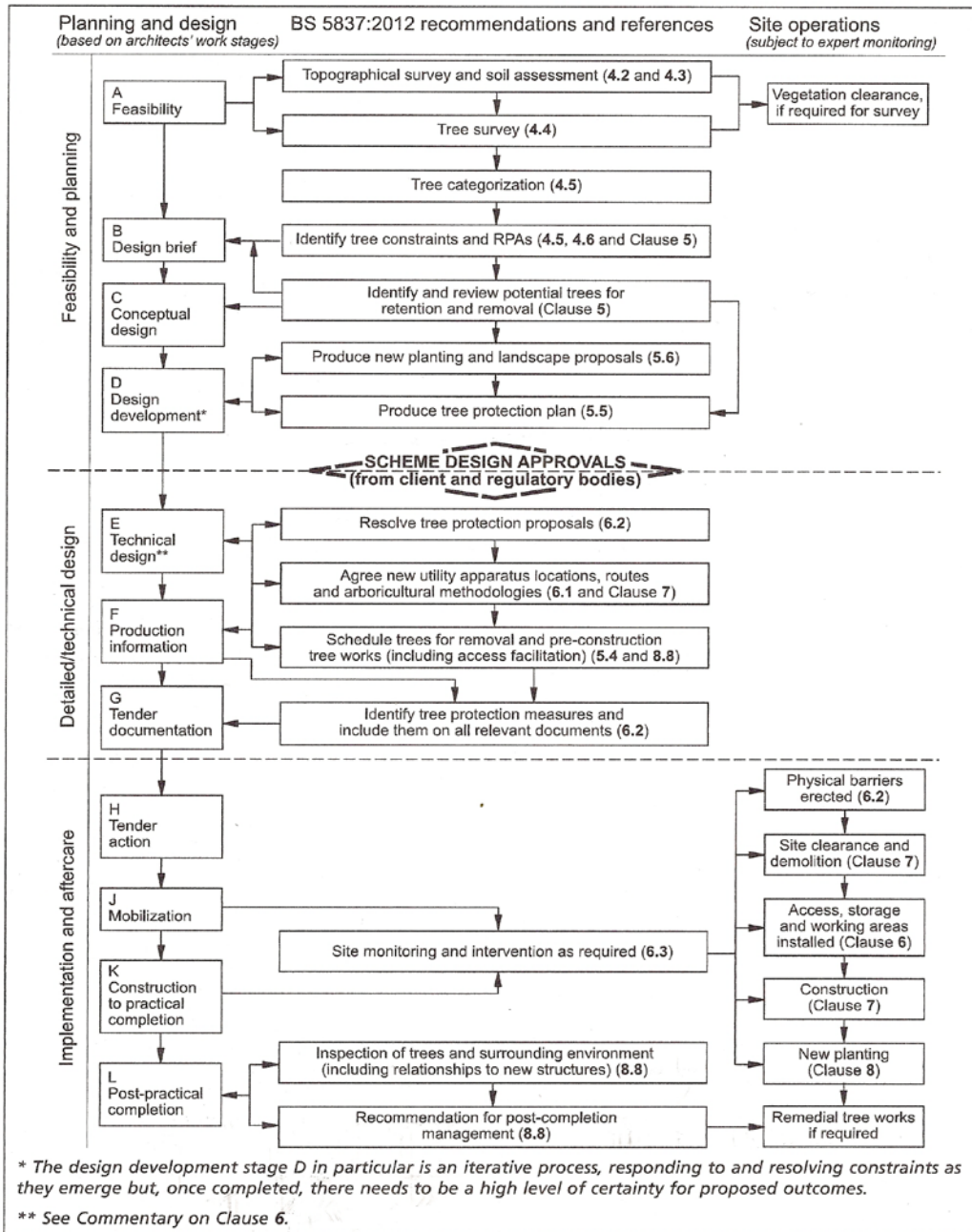


Figure 1 The design and construction process and tree care



## Addendum 5 – Plans and Picture Gallery