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**ARBORICULTURAL IMPLICATIONS ASSESSMENT
FOR
PROPOSED BASEMENT AND GYM EXTENSION**

AT

**10 ELSWORTHY ROAD
LONDON
NW3 3DT**

BY

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1. INTRODUCTION

- 1.1 Broad Oak Tree Consultants Ltd. received instructions from Ms. Lorna Klimt through Zac Monro Architects. The purpose of the inspection was to produce a base inventory of the tree stock and an Arboricultural Implications Assessment of development proposals.
- 1.2 The proposals are for a ground floor and basement extension to the existing ground floor flat and the construction of a single storey gym extension to the existing garage. Details of the proposals will have been submitted by Zac Monro Architects.
- 1.3 The trees were inspected in May 2017 by Tim Laddiman, BSc.(Hons) M.I.C.For. M.Arbor.A., Chartered Arboriculturist and Principal Consultant of Broad Oak Tree Consultants Ltd.

2. GENERAL SITE DESCRIPTION

- 2.1 No. 10 Elsworthy Road is a semi-detached three storey residential property, located on the north side of Elsworthy Road and sub divided into three flats. The property has a small front garden with paving, shrubs and a squat small tree, with a long narrow, relatively level rear garden with a lawn and various borders. To the north-east corner is a flat roof single garage accessing onto King Henry Road. Across the rear garden boundary and extending into the garden of No. 12 Elsworthy Road to the west is a crowded row of mature deciduous trees.

3. SCOPE OF TREE SURVEY

- 3.1 All trees and shrubs of 75mm diameter or more at 1.5m above ground level were included in the survey. This included trees immediately adjacent to the site.
- 3.2 For the offsite trees estimates of location, dimensions and condition had to be made.

4. DATA COLLECTION

- 4.1 All trees were inspected from the ground and no climbing or specialist investigations were undertaken. Only those trees within the site boundary could be basally inspected, with the structural integrity of the trees located outside the site unconfirmed. Each tree was inspected to the requirements of Section 4.4 of BS 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations".
- 4.2 The tree survey followed the numbered sequence from T1 to G10 inclusive. Tree numbers, together with BS recommended colour coding of condition, have been added to the Tree Constraints Plan, our drawing no. J53.97/01 in Appendix 2. This drawing also includes crown spreads based on four compass points and BS calculated root protection areas.

4.3 The following categories of information were obtained for each tree. Separate detailed tree survey sheets are attached in Appendix 1, together with comprehensive explanatory sheets which cover the details of the categories listed below.

- (1) Tree reference number
- (2) Species
- (3) Height in metres
- (4) Stem count
- (5) Stem diameter or equivalent in millimetres
- (6) Branch spread in metres
- (7) Age class
- (8) Height of crown clearance in metres
- (9) Physiological condition
- (10) Estimated remaining contribution in years
- (11) Category grading
- (12) Structural condition
- (13) Preliminary management recommendations

4.4 Within the assessment of physiological condition and remaining contribution, a visual inspection of each tree was undertaken to assess the crown and stem for any weak structures, deadwood, hollows, forks or other defects that might affect its stability and safety. The base of each tree was also visually inspected, together with tapping and probing, to search for signs of root lifting, bark death or decay. Where stems were heavily ivy clad, no full assessment of structural integrity could be undertaken. Clearance of the ivy would be necessary for confirmation of tree condition.

5. RISK ASSESSMENT - INFORMATIVES

5.1 Although the potential risk to someone passing beneath a tree when the tree or part of it fails is relatively remote, the risk is present. This increases significantly in areas of consistent and regular usage on a year round basis, such as footpaths, gardens and roadways. Where static structures exist, the risks become constant and an assessment is made as to whether complete or partial failure of a tree could potentially cause physical damage to such structures.

5.2 Within the scope of any tree survey it is a fact that not all risks of stem or crown failure can be covered, particularly in relation to freak occurrences of weather when even healthy trees can suffer stem snap or windblow. There is also a well known propensity for mature trees to occasionally shed limbs for no discernible reason, even on calm days. Although relatively rare, limbs may occasionally be shed and this should be acknowledged as a risk that cannot entirely be mitigated.

6. RESULTS OF TREE INSPECTIONS

- 6.1 A total of nine individual trees and one small group of two trees were inspected, including trees in the front garden of No. 8 Elsworthy Road and the front and rear of No. 12 Elsworthy Road.
- 6.2 The trees range considerably in age from young Pittisporum and Bay of less than ten years of age to Lime and Poplar of upto 100 years of age.
- 6.3 The oldest trees are arranged across the rear garden of No. 10 Elsworthy Road and no. 12 Elsworthy Road and would originally have been planted to provide visually pleasing screening. Rapid growth resulted in the crowns of the Limes T3 and T4 and the Maple T5 having been raised and heavily reduced in the past. Similarly the Lime T9 in the front garden of No. 12 Elsworthy Road has been raised and pollarded on numerous occasions in its past to control its dimensions.
- 6.4 Of the trees inspected, the following is a breakdown of the various numbers of trees and groups in each BS category.

BS Category	Tree No.	Sub Total
A	-	-
B	G2, 3, 4, 5, 9	5
C	1, 6, 7, 8, G10	5
U	-	-
	TOTAL	10

6.5 *Interpretation of table*

- Category A** Retention most desirable. Of high quality and value and in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested).
- Category B** Retention desirable. Of moderate quality and value and in such a condition as to make a significant contribution (a minimum of 20 years is suggested).
- Category C** Could be retained – of low quality and value. Poor crown form, heavily asymmetric, large numbers of similar species/size. Currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested) or young trees with a stem diameter below 150mm.
- Category U** Trees for removal. Dead/dying/dangerous trees due to structural defects, fungal decay or root plate uplift. Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management.

7. BS CALCULATED ROOT PROTECTION AREAS (RPAs)

- 7.1 To provide an indication of the critical areas of root plate necessary for tree survival and longevity, BS 5837:2012 requires the calculation of RPAs for trees in the BS Categories A, B and C. Calculations are not made for Category U trees which will require removal on safety grounds within 10 years.
- 7.2 The table below has been calculated using the measured stem diameters and the formula as described in Section 4.6 in BS 5837:2012. These are represented as basic circles on the Tree Constraints Plan. Where buildings, walls, services and hard surfacing exist within the indicated RPAs it is likely that the architecture of root systems will have been affected. Foundations to walls and buildings can completely obstruct root development, depending on their depth and the nature of the underlying soils. In the absence of detailed site investigations the indicated RPA circles should be used for guidance only within any development proposals.

Tree no.	Species	BS Category	Stem diameter or calculated equivalent (mm.)	BS calculated radial equivalent root protection area (m.)	BS calculated total RPA (m ²)
1	Hornbeam	C2	c.350	c.4.2	c.55
G2	2 No. Poplar	B2	<600	<7.2	<163
3	Common Lime	B2	580	7	154
4	Common Lime	B2	470	5.6	99
5	Norway Maple	B2	430	5.2	85
6	Pittosporum	C2	200	2.4	18
7	Bay	C2	100	1.2	5
8	Cypress var.	C1	c.100	c.1.2	c.5
9	Common Lime	B2	c.450	c.5.4	c.92
G10	2 No. Magnolia	C2	<210	<2.5	<20

ARBORICULTURAL IMPLICATIONS ASSESSMENT

8. DEVELOPMENT PROPOSALS

- 8.1 The proposals are for a ground floor and basement extension to the existing ground floor flat and the construction of a single storey gym extension to the existing garage. Details of the proposals will have been submitted by Zac Monro Architects.
- 8.2 The supplied proposed layout plan produced by Zac Monro Architects has been used as the base for the Broad Oak Tree Consultants Ltd. Tree Protection Plan, drawing no. J53.97/03 in Appendix 3. This indicates trees for removal and measures to protect retained trees in accordance with BS5837:2012 requirements.

9. TREES FOR REMOVAL – DEVELOPMENT

- 9.1 Based on the supplied proposal plan the following trees would require removal.

Tree No.	Species	BS Category	Comments
T6	Pittisporum	C	Large shrub crowded to N.
T7	Bay	C	Small, compact tree.
T8	Cypress var.	C	Small tree. Squat, poorly formed.

- 9.2 All of the above are small, young trees of no visual amenity value. All are BS category C and as such their removal should not represent a constraint, according to BS5837:2012.
- 9.3 The trees for removal are indicated as such with blue dashed crown outlines on the Tree Protection Plan.

10. POTENTIAL IMPACT OF PROPOSALS ON RETAINED TREES

- 10.1 Based on the supplied layout the proposals should not have an adverse impact on any of the retained trees.
- 10.2 The basement works are unlikely to affect roots of the adjoining Lime, T9, with the boundary wall foundations restricting any root presence within the front garden. This will have been present prior to the planting of the tree and as roots developed they would deflect along the line of the foundations. Water typically condenses against brickwork/concrete and would represent an ideal location for root proliferation along the wall alignment.
- 10.3 Should any roots be present under the main part of the front garden, proposals have been indicated on the Tree Protection Plan to avoid any compaction to the soils.
- 10.4 If there is limited root presence where the excavations are proposed these will be neatly cut back to the excavation face nearest the tree to minimise tissue exposure and wound size. As Third Party Roots they would be technically trespassing within the site and the owners would be within their Common Law Rights (subject to any statutory protection) to sever the roots. Consequently any potential root presence, whose loss would be highly unlikely to destabilise or cause decline to the tree, cannot be given planning weighting against the proposals.

10.5 To the rear the proposed gym extension is a lightweight, single storey structure located outside of indicated tree RPAs. Whilst the road to the north will be restricting some root presence the potential impact of the gym extension would be limited. As a relatively lightweight structure the foundation design will reflect its support requirements, based on the soils present. If a reinforced slab design is utilised any roots present below the formation level will not be adversely affected.

11. TREE PROTECTION MEASURES - FENCING

11.1 *Location of fencing*

11.1 The Tree Protection Plan indicates the proposed location of protective fencing based on the calculated tree protection areas and space available.

11.2 *Design of fencing*

11.2.1 The protective fencing is to be constructed of scaffold uprights driven into the ground to a minimum depth of 0.6m and at no greater than 3m spacing. Uprights to be braced with angled scaffold poles and anchors. On to the uprights weldmesh panels such as "Heras" or a similar product will be securely mounted with all weather notices attached to every 5th panel reading "Keep Out – Protected Area". The fencing will form enclosed areas to which no access will be allowed. This design of fencing is considered appropriate to the site and scale of development proposed.

11.2.2 Examples of the fencing specification and signage required are included in Appendix 4.

11.3 *Timing of fencing*

11.3.1 Protective fencing is to be erected prior to commencement of site works and remain in place until completion of construction. The location and suitability of the fencing can be confirmed to the local authority by an arboricultural consultant prior to commencement of construction. Any tree felling will need to be undertaken prior to fence installation to minimise risks to operatives. All tree surgeons' vehicles will be kept outside the indicated protection zones utilising existing areas of hard standing and drive.

11.4 *Additional precautions*

11.4.1 Potentially injurious materials such as fuels, oils, chemicals and cement will be stored at least 20m from any stem, or in a bunded storage vessel. No fires will be lit within 5m of the drip line of any retained tree. No level changes will occur, either raising or lowering within the protected areas. A list of these additional precautions are included on the Tree Protection Plan.

12. TREE PROTECTION MEASURES – GROUND PROTECTION

- 12.1 In areas within root protection zones where access will be required during construction, specific ground protection measures will be necessary to avoid compaction damage. These should comprise interlocking, specifically designed load bearing temporary roadway plates, commonly made of steel or specialised plastics. They will minimise any risk of compaction whilst providing a running platform for machinery.
- 12.2 Where foot access only is required, ground protection measures should comprise a base layer of geotextile, over which 100mm of woodchip will be laid, topped by side butting scaffold boards or non-slip surfaced minimum 20mm thick plywood or other man made boards.
- 12.3 Installation of the ground protection measures should take place at the same time as the protective fencing, prior to site works commencing, and remain in place until completion of construction.

13. SITE OPERATIONS AND MATERIALS STORAGE

- 13.1 Details of site zoning cannot be specified by an Arboriculturalist as these are commonly determined by contractors on the basis of Health & Safety Assessments. However, the robust protective fencing will define the remaining site space available for storage and operations.
- 13.2 It is presumed that all of the front garden will be required for the storage of materials, arising etc. and any welfare/cabins. As such all of the west side of the garden has been indicated to be covered in ground protection to avoid any soil compaction in case roots from the neighbours Lime, T9, are present.
- 13.3 As this is a small scale development the requirement for storage space is minimal and materials will be delivered on an “as and when” needed basis in appropriate quantities for the space available.

14. SERVICE/DRAINAGE/SOAKAWAYS

- 14.1 Based on the supplied layout, any new service or drainage alignments will be outside root protection areas. Where possible the existing runs currently serving the building should be reused. If incursion into the protective areas of retained trees is unavoidable, then the routing should be obtained either by thrust boring or hand excavation, supervised by an arboricultural consultant. Any works within the protective areas will need to be undertaken to the requirements of NJUG Volume 4 “Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees”.

15. ARBORICULTURAL METHOD STATEMENT

15.1 A separate Arboricultural Method Statement is not considered necessary for this site. Details of the fencing and ground protection specification, timing and location are indicated on the Tree Protection Plan, which can be referred to in a specifically worded condition.

16. SUMMARY

16.1 The proposed basement works and gym extension would require the removal of three small trees/shrubs, all BS category C and of no visual amenity value.

16.2 Impacts on retained trees would be minimal and provided appropriate tree protection measures are applied to avoid compaction the trees within and adjoining the site should not be adversely affected.

16.3 The Tree Protection Plan can be referred to in a specifically worded condition to ensure that the recommended protection measures are applied.

Tim Laddiman
Chartered Arboriculturist
Broad Oak Tree Consultants Ltd.

APPENDIX 1

TREE SURVEY EXPLANATORY SHEET

Height	in metres (estimated where ground uneven or access restricted).
Stem count	number of stems
Stem diameter	in mm. at 1.5m. above ground level.
Branch spread	radial spread in metres at four main compass points (estimated where no access).
Age class	Young - Y Middle aged - MA Mature - M Over mature - OM Veteran - V
Height of crown clearance	in metres. Normally range of heights of outer branches above ground level, e.g. 2-4m.
Physiological condition	Good, Fair, Poor, Dead, Variable
Estimated remaining contribution	in years e.g. less than 10, 10-20, 20-40, 40+
Category grading	see attached sheet
Structural condition	comment on presence of defects, decay, crown form, past management, deadwood, other features worthy of note. N.B. If trees are ivy clad, no full structural assessment will have been possible.
Preliminary management recommendations	requirements of further investigations, works necessary to alleviate potential hazards based on current setting and levels of access. NB: Works that may be necessary in relation to development are not included here

CASCADE CHART FOR TREE QUALITY ASSESSMENT

TREES FOR REMOVAL				
Category and definition	Criteria			Identification on plan
Category U Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management	<ul style="list-style-type: none"> • Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other R category trees (i.e. 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 safety of other trees nearby (e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality NOTE Habitat reinstatement may be appropriate (e.g. R category tree used as a bat roost: installation of bat box in nearby tree.)			DARK RED
TREES TO BE CONSIDERED FOR RETENTION				
Category and definition	Criteria - Subcategories			Identification on plan
	1. Mainly arboricultural values	2. Mainly landscape values	3. Mainly cultural values, including conservation	
Category A Those of high quality and value: in such a condition as to be able to make a substantial construction (a minimum of 40 years is suggested)	Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups)	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	LIGHT GREEN
Category B Those of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested)	Trees that might be included in the high category, but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage)	Trees present in numbers, usually as groups or woodland, such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals but which are not, individually, essential components of formal or semi-formal arboricultural features (e.g. trees of moderate quality within an avenue that includes better, A category specimens), or trees situated mainly internally to the site, therefore individually having little visual impact on the wider locality	Trees with clearly identifiable conservation or other cultural benefits	MID BLUE
Category C Those of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150mm.	Trees not qualifying in higher categories	Trees present in groups or woodland, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit.	Trees with very limited conservation or other cultural benefits	GREY
NOTE Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation				

Tree ref. no.	Species	Height (m.)	Stem Count	Stem diameter or equivalent (mm.)	Branch spread (m.)				Age class	Ht. of crown clearance (m.)	Physiological condition	Estimated remaining contribution (years)	Category grading	Structural condition and notes	Preliminary management recommendations
					N	E	S	W							
1	Hornbeam	11	1	c350	c3	5	c5	c5	Y	2+	Unconfirmed	20-40	C2	Twin stemmed at 2.5m. Located in adjoining garden therefore no basal inspection.	
G2	2 No. Poplar	<22	1	<600	<4	<3	<5	<3	M	5+	Unconfirmed	20-40	B2	Located in adjoining garden therefore no basal inspection. Tall slender canopies forming one.	
3	Common Lime	18	1	580	5	3	5	3	M	1.1+	Unconfirmed	20-40	B2	Crowded. Twin stemmed at 3m. Three stems under 4.5m. Debris around base. Old lower stem wound to E. mostly occluded. Crown raised and reduced in past. Only fine growth below 6m. Crown reduced in past.	
4	Common Lime	18	1	470	5	5	4	1	M	2+	Fair	20-40	B2	Basal wound to SW with internal decay. Wound site mostly occluded. Leaning E. Crown reduced and raised in past with fine branches below 7m. Twin stemmed at 2.5m, one stem dominant.	
5	Norway Maple	14	1	430	5	5	5	1	M	2+	Fair	20-40	B2	Near base wound to S with internal decay. Mostly occluded. Crowded. Three stems at 2.5m-3m. Crown raised and reduced in past.	

Tree ref. no.	Species	Height (m.)	Stem Count	Stem diameter or equivalent (mm.)	Branch spread (m.)				Age class	Ht. of crown clearance (m.)	Physiological condition	Estimated remaining contribution (years)	Category grading	Structural condition and notes	Preliminary management recommendations
					N	E	S	W							
6	Pittosporum	6	Multi	200	1	2	2.5	1.5	MA	1+	Good	20-40	C2	Part ivy clad. Crowded. Multi stemmed under 1m. Lean to S. Pruned in past.	
7	Bay	3.5	1	100	1	0.5	0.5	0.5	Y	1+	Good	40+	C2	Clipped elongated obelisk form.	
8	Cypress var.	3	1	c100	4	3	2	0	Y	0+	Poor	10-20	C1	Squat crown. Main leader lost. Long spreading thin limbs.	
9	Common Lime	13	1	c450	3.5	3.5	3.5	2	M	1.1+	Unconfirmed	20-40	B2	Three stemmed at circa 3m where pollarded in past. Crown reduced in past. Located in adjoining garden therefore no basal inspection.	
G10	2 No. Magnolia	<7	2	<210	<1	<1	<4	<3	MA	1.6+	Unconfirmed	20-40	C2	Inter crowded. Crowns mainly to S. Pruned to N and E. Located in adjoining garden.	

APPENDIX 2

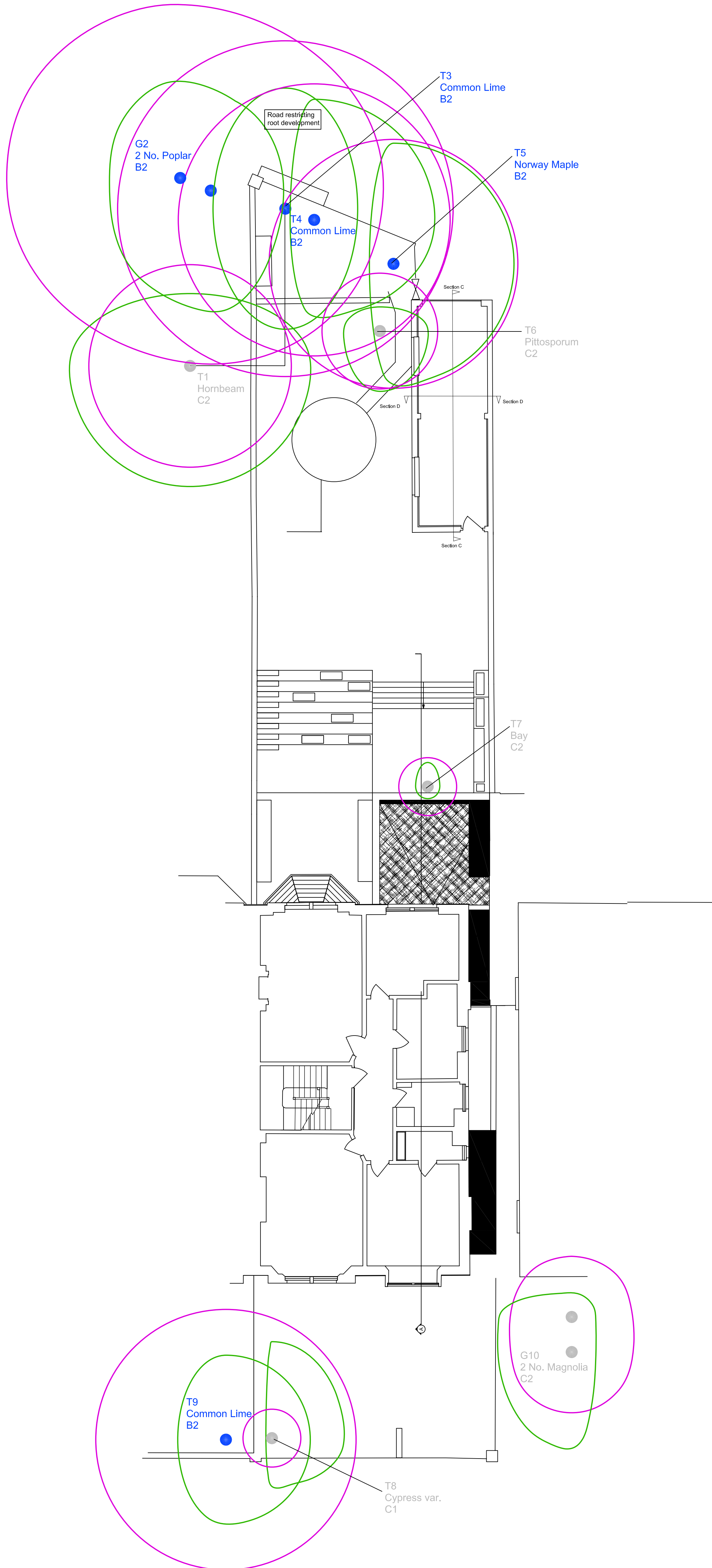
TREE CONSTRAINTS PLAN

T1 - G10 Tree numbers

BS Category of Condition

- 0 BS Condition A
- T3 BS Condition B
- T1 BS Condition C
- 0 BS Condition U
- Paced crown spread
- BS Calculated root protection areas

The root protection areas have been calculated using the measured stem diameters and the formula as described in Section 4.6 in BS5837:2012. These are represented as basic circles on the Tree Constraints Plan. Where buildings, walls, services and hard surfacing exist within the indicated RPAs, it is likely that the architecture of root systems will have been affected. Foundations to walls and buildings can completely obstruct root development, depending on their depth and the nature of the underlying soils. In the absence of detailed site investigations, the indicated RPA circles should be used for guidance only within any redevelopment proposals.



APPENDIX 3

TREE PROTECTION PLAN

T1 - G10 Tree numbers

BS Category of Condition

- 0 BS Condition A
- T3 BS Condition B
- T1 BS Condition C
- 0 BS Condition U

 Paced crown spread

 BS Calculated root protection areas

 Tree to be removed for development

 Protective fencing location

 Ground protection

TREE PROTECTION INFORMATION

Protective fencing and ground protection measures to be installed at locations specified prior to commencement of any demolition works.

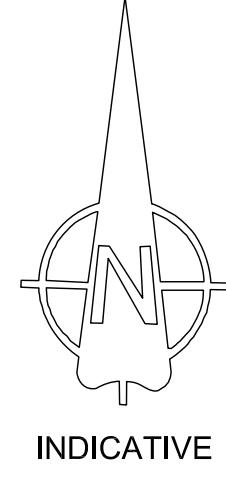
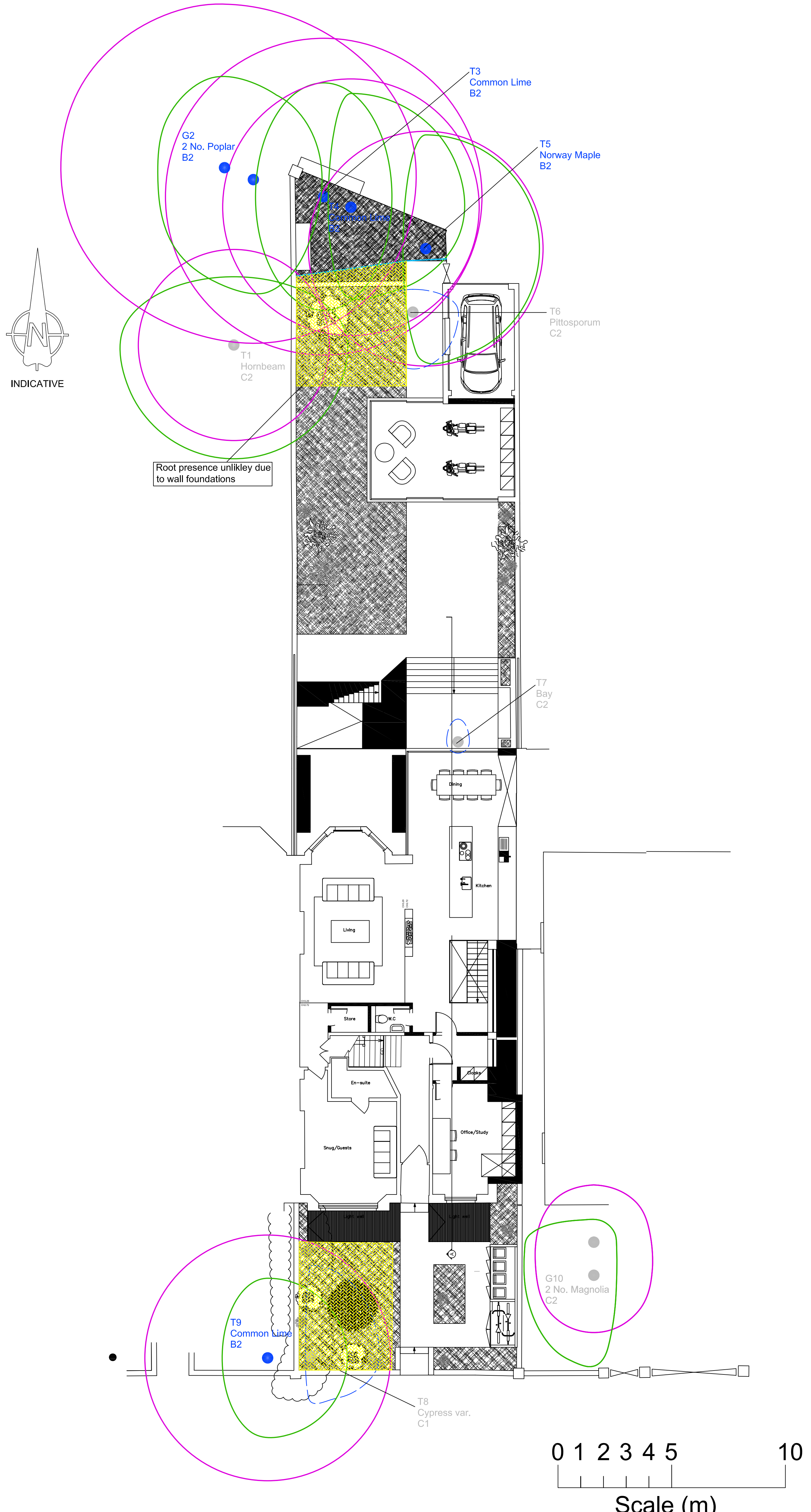
Protective fencing to comprise scaffold uprights driven into the ground to 60cm depth at no more than 3m spacing. Upright to be braced within high usage/construction/demolition areas. Weldmesh panels to be securely fixed to uprights to produce a continuous barrier. Waterproof signs to be attached to every 5th panel declaring "TREE ROOT PROTECTION ZONE - KEEP OUT" or similar wording. Fencing to be constructed in accordance with fig 2 and section 6 Specifications of BS5837:2012.

Ground protection measures to comprise a single thickness of side butting scaffold boards over a 100mm compressible layer laid onto a geotextile.

The fenced protection zones around retained trees, hedges and shrubbery are to be regarded as sacrosanct and none of the following are to occur within these areas:

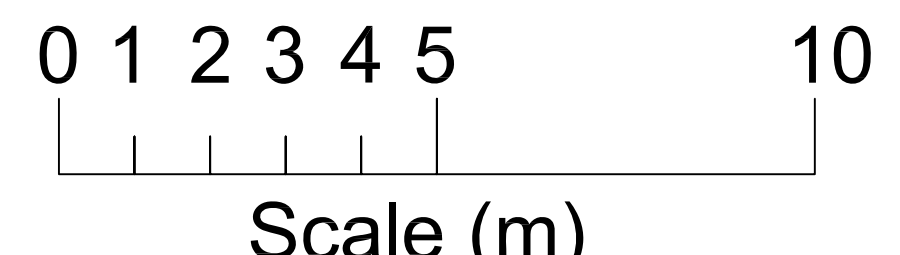
- Storage or disposal of any soil, building materials, machinery, fuel or waste residues of any description.
- Siting of any temporary structures of any description including site office/sales buildings, temporary car parking facilities, porta-loos, storage compounds or temporary hard standing areas.
- Excavations, soil/turf stripping, raising/lowering of existing levels or alterations to the existing natural surfaces/ground conditions of any other description.
- Location of temporary drainage, water supplies or any other temporary underground services.
- No use, movement or parking of any machinery or vehicles of any description.

Additionally, no fires shall be lit within 20m of the trunks of any trees or the centre line of any hedgerow to be retained. All services to be installed to the requirements of NUIG Volume 4 "Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees". Any runs within retained tree root protection areas to either be bored/holed or any hand excavation to be supervised by the Arboricultural Consultant



INDICATIVE

Root presence unlikely due to wall foundations



Scale (m)

APPENDIX 4

BS5837:2012: FENCING SPECIFICATIONS

Figure 2 Default specification for protective barrier

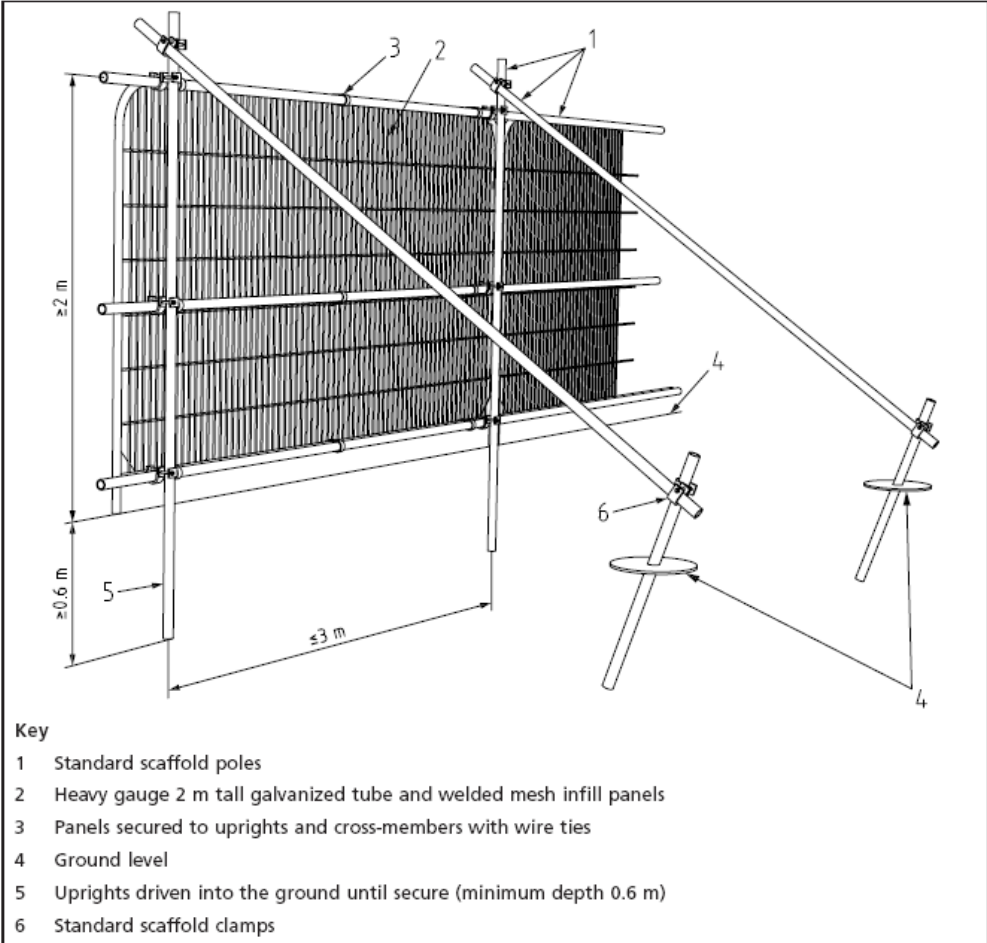
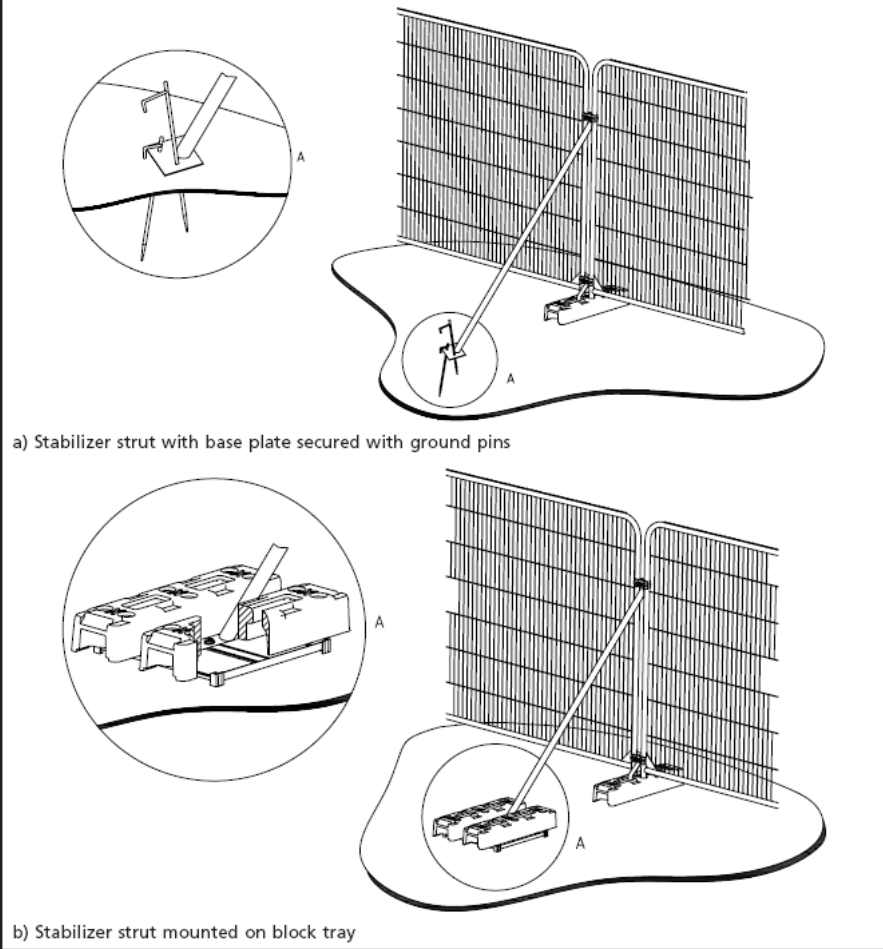


Figure 3 Examples of above-ground stabilizing systems



EXAMPLE OF FENCING SIGNAGE

