APPENDIX

Broad Oak Tree Consultants Limited
Laurel House, Burwash Road, Broad Oak, Heathfield, East Sussex
TN21 8SS Tel: 01435 862444 office@broadoaktrees.co.uk

Arboricultural Association
Professional Member
Mr Tim Laddiman
Principal Consultant
(Membership No. PR1565)

ARBORICULTURAL ASSESSMENT OF TREES IN RELATION TO ALLEGED SUBSIDENCE

PROPERTY ADDRESS:	**30 ELSWORTHY ROAD LONDON NW3 3DL**
INSURED:	**MR & MRS JOWELL**
INSTRUCTIONS RECEIVED FROM:	**BICKLEY CHARTERED LOSS ADJUSTERS LIMITED**
REPORT PREPARED BY:	**TIM LADDIMAN BSC.(HONS) M.I.C.FOR. M.ARBOR.A. CHARTERED ARBORICULTURIST**
DATE OF SITE VISIT:	**16th JANUARY 2023**
DATE OF REPORT:	**3rd NOVEMBER 2023**
OUR REFERENCE:	**J63.64**

CONTENTS

APPENDICES:

1. INTRODUCTION

1.1 Broad Oak Tree Consultants Ltd. received instructions from Bickley Chartered Loss Adjusters Limited to review the available information and to assess trees in relation to alledged subsidence movement at 30 Elsworthy Road, London, NW3 3DL.

1.2 Recommendations have been sought with regards to potential vegetation management solutions that may assist in stabilising the movement.

1.3 The trees and general vegetation in proximity to the affected building were inspected on 16th January 2023 by Tim Laddiman, BSc.(Hons) M.I.C.For. M.Arbor.A., Chartered Arboriculturist and Principal Consultant of Broad Oak Tree Consultants Ltd.

1.4 At the time of reporting checks with the London Borough of Camden have indicated that the site is located within the Elsworthy Conservation Area. Reference is also made to a Tree Preservation Order on a London Plane in the front garden.

1.5 The supplied information comprised the following:

- Letter report, dated 29th September 2022, produced by David Carr Consulting Engineers Ltd.
- Geotechnical Report, dated 6th January 2023, produced by Herts & Essex Site Investigations.

2. GENERAL SITE DESCRIPTION

2.1 No. 30 is a semi detached residential property located on the north side of Elsworthy Road, forming the eastern half of the pair of houses.

2.2 The frontage of the property comprises a surfaced parking bay to the west with a light well retaining wall. A large set of steps leads up to the front door at an elevated level with a paving surfaced side passage to the east. Along the east and west boundaries are planting borders with a variety of trees and shrubs within and adjoining the site. To the rear is a long, level rectangular garden primarily down to lawn with planted borders.

3. TREE LOCATIONS AND DESCRIPTIONS

3.1 The principal vegetation within theoretical influencing distance of the front of the property are described in tabular form in Appendix 1. The approximate locations of the various trees and shrubs are indicated on the Tree Location Plan, drawing no. J63.64/01 in Appendix 2. Photographs for visual reference purposes are included in Appendix 3.

4. SUMMARY OF SUPPLIED INFORMATION

4.1 *Soils and foundations*

4.1.1 The Geotechnical Report indicates two trial pits were excavated in December 2022 with TP1 to the southeast corner of the steps and TP2 to the southeast corner of the house.

4.1.2 The trial pit cross sections indicate made ground to termination at 1.83m in TP1 comprising slightly silty Clay with clinker ash and brick fragments. In TP2 made ground is indicated to circa 1m depth with slightly silty Clay below to termination at 3m.

4.1.3 A window sampler sunk to the southwest of the parking bay described made ground to 1.5m depth with slightly silty Clay to termination at 8m.

4.1.4 Soil test results are primarily for TP2 with plasticity indices ranging from 46-53% indicating very high shrinkage potential. Soil moisture contents at foundation level, 2m and 3m depth are close to the plastic limits of the soils and at or below 40% of the Liquid Limit, used as an indicator (Driscoll) of desiccation.

4.1.5 Foundations to the steps at TP1 are recorded as of 580mm total depth below ground level. At the junction with the house they are recorded as 1100mm total depth, comprising crushed red brick, rather than concrete. The foundations to the house at TP2 are also recorded as of 1100mm total depth. It is presumed the house foundations within the light well on the frontage will be deeper but have not been investigated.

4.2 *Presence of roots*

4.2.1 Reference is made to roots being present to the full depth of TP1 and TP2 and to 2.4m depth in the window sampler.

4.2.2 Root sample identification undertaken by European Plant Science Laboratory and included in the Geotechnical Report indicated recently alive samples of *Ailanthus spp* in TP1 and TP2, together with samples identified as *Leguminosae spp* and Euonymus spp in TP1.

4.2.3 *Ailanthus spp* is listed as Tree of Heaven with the *Leguminosae spp* potentially from Laburnum, False Acacia, Broom, Pagoda Tree or Wisteria. Euonymus spp is listed as deciduous and evergreen garden shrubs.

4.3 *Reported damage*

4.3.1 The letter report of 29th September 2022 details internal and external cracking primarily noted in the front entrance porch steps. Reference is made to minor cracks in the front elevation and eastern flank, with a number representing re-opening of previously repaired cracks. No reference is made to any external cracking to the north (rear) of the house.

4.3.2 The front entrance steps reportedly have cracking of up to 5mm width on either side and in the top of the side walls.

4.3.3 Internally there appears to be limited cracking of generally 1mm width or less with cracking within the Boiler Room beneath the entrance steps mirroring some of the external cracks and of greater extent.

4.3.4 The engineer's letter report concludes that subsidence movement has occurred to the southeast corner of the main house (BRE Digest 251 Category I), together with Category II damage to the front entrance steps. This is indicated to be due to Clay shrinkage caused by vegetation. This includes referenced cracking in the boundary wall between no's 30 and 32. The report recommends the removal of the main sources of vegetation based soil drying.

4.3.5 It is understood that level monitoring of the site is supposed to have occurred but no results of any monitoring have been provided at the time of reporting.

5. DISCUSSION

5.1 The timing of the initial cracking has not been confirmed but is presumed to have occurred during the very hot and dry summer of 2022, based on the timing of the letter report. The report concludes that a vegetation based subsidence event has occurred, although no level monitoring results have been provided to show seasonality of movement.

5.2 With the vegetation located within a Conservation Area and with a TPO present the Council will be looking for proof that the movement is seasonal, and hence vegetation related, rather than progressive and possibly due to other causes if requests are made for tree removals. The level monitoring would be essential for this, although the circumstances would suggest that vegetation related moisture extraction is the most likely causal factor.

5.3 The site investigations identified highly shrinkable Clay based soils with desiccation present to depth. Roots were also noted in all locations up to 3m depth with samples from TP1 and TP2 indicating T2 Tree of Heaven to have roots present well below foundation depths. This is the largest tree present and the most likely source of soil drying, contributed to by the surrounding large shrubs. Their proximity to the steps will represent significant localised soil drying, sufficient to cause a subsidence event.

5.4 The Tree of Heaven has been crown raised in the past and canopy reduced on at least several occasions. This will have controlled overall moisture demands to an extent but the restricted growing conditions and proximity of the steps in particular mean that it is inappropriately large for the situation. The surrounding shrubs have developed considerably over the years and the Himalayan Cotoneaster (T1) in particular is over dominant of the relatively small planting bed. It is assumed this has been allowed to develop to such dimensions to provide year round screening.

5.5 To the west side the shrub/tree presence is more limited with the dominant vegetation located in the garden of No. 32. Cracking to the boundary wall is likely a combination effect of the shrubs and various Laurels, together with the root system of the large climber on the front of the building. This will have a considerable moisture demand not just due to its foliar area but due to additional evapotranspiration occurring due to the solar heating of the brickwork. This represents a concentrated drying influence close to the wall and front of No. 30 and 32 with associated subsidence risks.

5.6 With vegetation the most likely causal agent in any seasonal subsidence event occurring the most straightforward solution would be removal of the vegetation. This would allow soils to rehydrate which should result in partial/complete crack closure sufficient to allow for repairs. However, with evidence of past crack repairs there could be some pressures placed on these previous repairs from any soil recovery due to any fill material and an engineer's view on likely recovery patterns would be recommended.

5.7 Following any vegetation removal a recovery period involving at least one winter would be recommended to allow soils to rewet and recover and cracks to achieve maximum closure prior to any repair works. Monitoring of cracks would be recommended through any recovery period.

5.8 As the vegetation is located within a Conservation Area notification of intent to undertake works (a Section 211 Notice) would need to be given to the Council giving them six weeks to consider placing a Tree Preservation Order (TPO) or to allow the works to proceed.

5.9 The Council checks identified a TPO at No. 30 on a London Plane, however no such tree is present. If this is a case of misidentification of T2 Tree of Heaven then the TPO may not legally apply, though legal counsel on this would be recommended.

5.10 For the large climber on the building no notification to the Council would be necessary as this would not be covered by the Conservation Area Regulations.

6. TREE WORK RECOMMENDATIONS

6.1 The following tree works are aimed at removing the main sources of soil drying in the vicinity of the house and front steps. A scorched earth removal policy is not recommended and any new planting or retained shrubs should be controlled in their dimensions. Possible canopy reduction of T1 and T2 has been discounted as an option as the steps are too close to the trees for canopy reduction to have anything but a very short term impact on moisture demands. Anticipated rapid regrowth following pruning would retain moisture demands to pre-pruning levels in a year or less with limited potential for soil recovery.

Tree work recommendations

Tree No.	Species	Works recommended
T1	Himalayan Cotoneaster	Fell to ground level. Grind out or poison stumps to prevent regrowth.
T2	Tree of Heaven	Fell to ground level. Grind out or poison stump to prevent regrowth.
G3	Escallonia	Maintain at maximum 2m height and 2m radial spread.
-	Castor Oil	Maintain at current dimensions.
-	Large Climber	Fell to ground level and grind out or poison stumps to prevent regrowth.

6.2 The following works relate to the boundary wall between No. 30 and 32 and whether resolving movement in this is a priority, depending on ownership of the wall.

Tree work recommendations

Tree No.	Species	Works recommended
G4	Cherry Laurel	Fell to ground level. Grind out or poison stumps to prevent regrowth.
-	Spotted Laurel	Fell to ground level. Grind out or poison stumps to prevent regrowth.
-	3m Shrub	Fell to ground level. Grind out or poison stumps to prevent regrowth.

6.2 All tree work should be carried out by a competent tree surgeon to comply with BS3998:2010 “Tree Work - Recommendations”.

6.3 All trees recommended for felling or tree surgery works should be checked for the presence of bats or nesting birds prior to works commencing. Disturbance to bats or nesting birds could contravene the Wildlife and Countryside Act 1981 and result in prosecution.

Tim Laddiman
Chartered Arboriculturist
Broad Oak Tree Consultants Ltd.

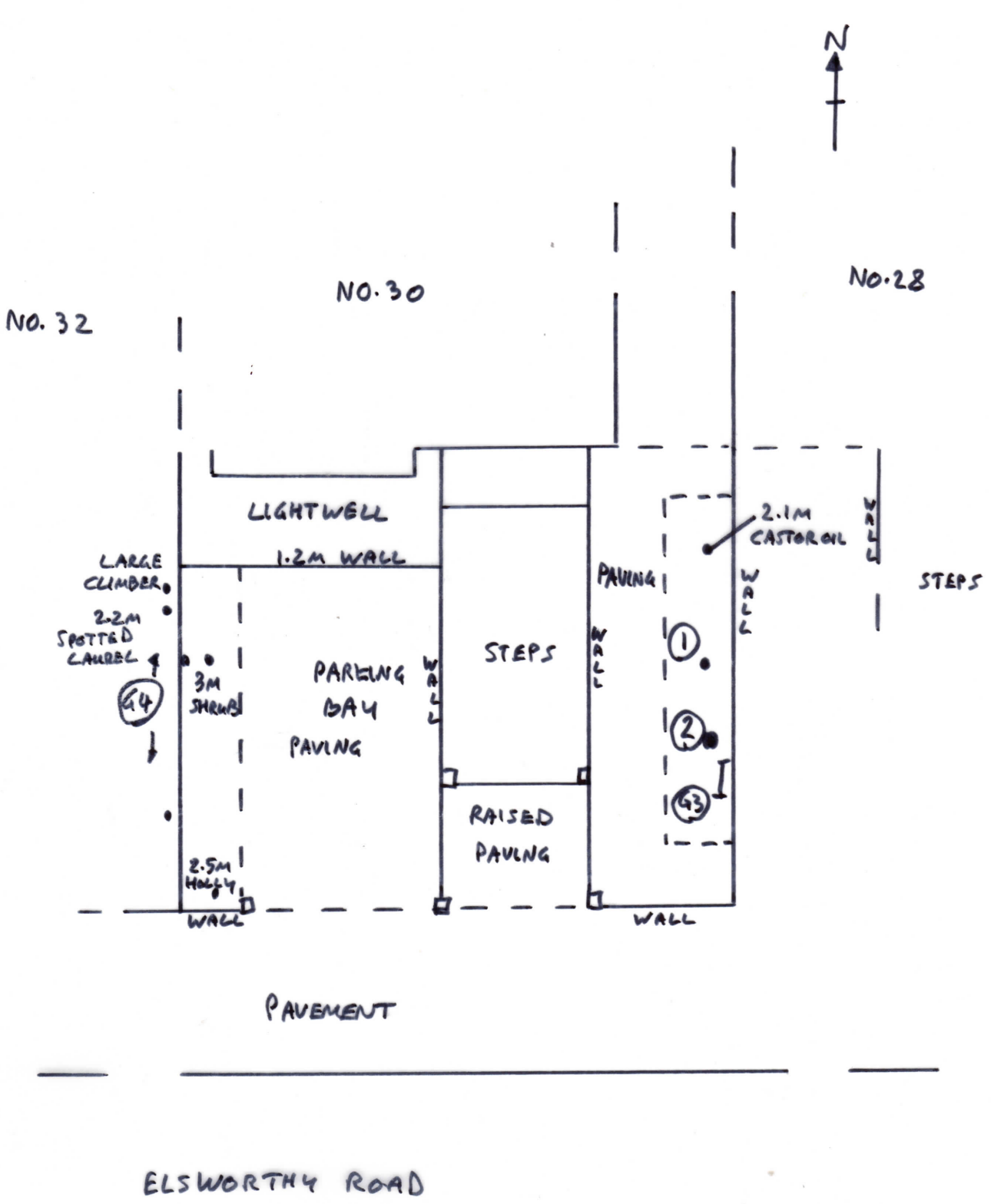
APPENDIX 1

KEY – SUBSIDENCE TREE SURVEY

Species	Identified where possible.
Height (m.)	measured in metres. Indicate (c.) if estimated
Stem Count	number of stems
Ownership	I = insured – within the garden/grounds of the affected property 3rd = 3rd Party - located in adjoining garden, street, etc. I / 3rd = located in middle of hedge/fence ? = unconfirmed ownership C = Council – located in park, pavement
Stem Diameter (mm.)	in mm. at 1.5m. above ground level.
Crown radius (m.)	radial spread in metres at four main compass points (estimated where no access).
Age Class	YY planted in last 10 years Y young – generally under 40 years old SM semi mature M large crown and diameter – looks old for species (e.g. holly and elder could be only 50-60 years)
Height of crown clearance (m.)	0 = crown to ground level, e.g. hedges, most cypresses, some weeping willows Otherwise height to lowest branches in metres.
Physiological condition	G = good; AV = average; P = poor
Estimated remaining contribution (years)	e.g. less than 10, 10-20, 20-40, 40+
Structural condition and notes	Comments on multi-stemmed, coppiced, grafted, past reduction works (at what level, how long ago), presence of deadwood, cavities, weak forks, decay, dead bark, open crown, overtopped, crowded to E, W, etc., thinning foliage, fungi, etc.
Preliminary management Recommendations	Any work recommendations on safety grounds due to identified hazards.

Tree ref. no.	Species	Height (m.)	Stem Count	Insured, Council Or 3rd party	Stem diameter or equivalent (mm.)	Crown radius (m.)				Age class	Ht. of crown clearance (m.)	Physiological condition	Estimated remaining contribution (years)	Structural condition and Notes	Preliminary management recommendations
						N	E	S	W						
T1	Himalayan Cotoneaster	3.5	Multi	Insured	<150	4	3.5	3	2.5	M	1.8+	Good	20-40	Multi stemmed at under 1m. Clipped back to W. to edge of stairs. Supressed.	
T2	Tree of Heaven	12	1	Insured	430	3.5	3	3	3.5	M	3.5+	Good	20-40	Twin stemmed at 3m. Three stems at 4m. Crown raised in past to circa 7m. Crown reduced on several occasions with regrowth. Clad in climber.	
G3	Escallonia	<3.5	Multi	Insured	<60	<3	<2	<2.5	<3	M	0+	Good	20-40	Densely multi stemmed. Clipped	
G4	2no. Cherry Laurel	<3	Multi	3rd	<80	<3	<2	<2	<1.5	SM	0+	Good	20-40	Clipped screening.	

APPENDIX 2



Broad Oak Tree Consultants Limited Laurel House, Burwash Road, Broad Oak, Heathfield, East Sussex, TN21 8SS Tel: 01435 862444	
Site:	**30 Elsworthy Road, London, NW3 3DL**
Title:	**TREE LOCATION PLAN**
Key:	
	Group Location
	Approximate Tree Location
T1 – G4	Tree/Group Number
Scale: 1:100 at A4	**Date:** 03/11/2023
DRAWING NO.: J63.64/01	

APPENDIX 3

APPENDIX 3 - PHOTOGRAPHS

T2 Tree of Heaven with T1 beneath to right and shrubs G3 to left, viewed from east. Note previous reduction points in canopy.

APPENDIX 3 - PHOTOGRAPHS

**View from west of T2 Tree of Heaven (centre)
with T1 to left and G3 to right.**

APPENDIX 3 - PHOTOGRAPHS

View of western boundary between No's 30 and 32 to show extent of climber on house.

APPENDIX 3 - PHOTOGRAPHS

View of vegetation along western boundary with G4 Cherry Laurel in adjoining garden.