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**A BS 5837 Tree Survey Report, Tree Constraints Plan,
Arboricultural Impact Assessment and Tree Protection Plan
for**

**Whittington Designer Homes Ltd
at**

11, Bound Lane, South Hayling

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1 Introduction

In July 2015, trees on and around the site at 11, Bound Lane, South Hayling, PO11 9HU were subject to a survey in line with BS 5837, 2012: *Trees in Relation to Design, Demolition and Construction: Recommendations*.

This report describes the tree survey and shows the results (a Tree Constraints Plan).

It then shows what trees will be affected by the proposals (an Arboricultural Impact Assessment) and how trees to be protected will be retained (a Tree Protection Plan).

2 Abbreviations

RPA = Root Protection Area(s)

TCP = Tree Constraints Plan

AIA = Arboricultural Impact Assessment

TPP = Tree Protection Plan

AMS = Arboricultural Method Statement(s)

BRP = Bat Roost Potential

3 Tree Survey

3.1 Survey Method

The survey visit took place in fine weather. Binoculars and a digital camera with a 24x optical zoom were used where appropriate.

The surveyor had a topographical survey plan showing the trees on the site.

All trees within/on the site boundary were considered, as were trees off site if the surveyor believed they may have a RPA that extended onto site, if their canopy overhung the site or if they were thought likely to reach the site should they fall. Such trees not shown on the topographical survey plan were added to the plan when considered relevant.

Conversely, some trees shown on the topographical survey plan were disregarded if they were considered irrelevant (small, 'scrappy' trees or shrubs).

The condition, dimensions, BS5837 category and RPA sizes of surveyed trees are listed in the Tree Survey List, Appendix 1.

The location, BS5837 category, RPA and canopy extents of the trees recorded are shown in the TCP figure, Appendix 2.

RPA have not been offset/adjusted.

The BRP of each tree was also considered.

After the TCP was prepared, it was provided to the project architects to enable them to design a layout that retained as many trees as possible. The layout was then superimposed on the TCP to allow Verdant Ecology to work out the impacts of the project on trees (the AIA) and to propose a TPP that would successfully protect the trees intended for retention.

3.2 Survey Limitations

No ladder or climbing work has been conducted.

DBH were measured using a tape measure. The heights of two trees (9 and 18) were checked using a lazer range finder (which has its own limitations, see below). All other dimensions were estimated/paced out, not measured. The topographical survey provided measured dimensions of trees and these were compared to Verdant Ecology's estimations. Although there were often discrepancies between the two, they were invariably minor and were attributed to minor differences in technique. For example;

- a) The topographic survey would (presumably) have used lazer measuring devices to record tree height that would require a branch 'substantial' enough to register, whereas Verdant Ecology estimated the highest point and;
- b) The topographic survey recorded average canopy extent whereas Verdant Ecology paced out the canopy extent along the four principle compass bearings.

These factors have been considered in influencing the development layout.

The survey was conducted whilst trees were in full leaf. This helps with determination of a tree's vigour but foliage may have obscured (relatively minor) structural flaws in the canopy. This is not considered significant because houses are not being built beneath retained tree canopies anyway.

The N, E and S edges to the site are boundaries with land in other, private ownership. This means that trees beyond these boundaries have had dimensions and stem locations estimated from a distance and were not viewed from all sides due to access restrictions. Some of these trees may thus have defects unknown that affect their suitability for retention or their BRP rating. This is not considered significant because these trees are unlikely to be affected by the proposals (or vice versa).

4 Trees in Need of Imminent Work

None of the trees on site were considered in need of urgent attention on health and safety grounds.

5 Tree Constraints Plan

The TCP in Appendix 2 shows the locations of trees on/near the site, their BS5837 category, their canopy extents and RPA. RPA have not been offset/adjusted.

U categorised trees are likely to be lost regardless of any proposed development.

There should be a presumption against impacts on A category trees.

B category trees should be retained if possible.

C category trees are of least concern but should be retained where they have potential and/or are useful e.g. for screening, for wildlife or whilst new planting becomes established.

Hedges are considered unlikely to be classified as 'Important' under the 1997 Hedgerow Regulations (they are too species-poor and can be considered the curtilage to a garden) but this has not been specifically established.

I understand that trees 28, 29 and 30 are the subjects of a Tree Preservation Order.

6 **Arboricultural Impact Assessment**

Once the TCP had been prepared, the proposed development was overlaid and impacts on trees assessed.

With guidance from a competent arborist, the original project layout has been adjusted so as to minimise impacts on trees.

It was recommended that no houses were built within range of trees 9 and 18 (off site to the S) should they fall because although showing no immediate cause for concern, they both lean and, tree 18 has had recent work around it's base that seems likely to have affected its roots and has had an adjacent tree recently? felled, changing it's exposure.

The layout has also been influenced by:

- The pre-application comments from the local authority (namely the retention of several frontage (TPO) trees, a desire to see the hedge along Bound Lane retained if/where possible and a hedge planted along the N site edge).
- The results of the ecology surveys (namely recommendations that perimeter strips were left undeveloped to retain some habitat suitable for slow-worms and to maintain habitat connectivity for bats and slow-worms).

6.1 **Trees Felled**

Trees numbered 20, 25, 32, 34, 35, 36, 37 will be felled. These are all C-categorised. Of these tree 25 was considered to have Medium BRP so needs to be included in the bat surveys proposed by the baseline ecology survey.

Approximately 11m of frontage hedgerow will be removed.

6.2 **Tree Affected but Retained**

Trees numbered 2, 22, 29, 30 will have activity within their RPA.

- 2 is a C-categorised tree (because it has been heavily managed) but is a frontage tree, visible from the street so it is intended for retention. This will be affected by the removal of existing paving slabs and the creation of a driveway in the RPA. The RPA could feasibly be reduced because it has been so heavily managed but this has not been done (nor should it be) because a large portion of the RPA is off site (and thus beyond 'control').
- 22, 29 and 30 are all B-categorised. I understand that 29 and 30 have a Tree Preservation order in place.

It is believed other trees/hedges can be retained intact and unaffected. However, we have not yet been provided with information on service runs, run-off control areas, changes in drainage, levels or gradients, all of which can also negatively affect trees. Consequently all service runs will have to come in via the proposed new access route (see the TPP).

7 Tree Protection Plan

A TPP figure is shown in Appendix 4.

- 1) Trees numbered 2, 22, 29, 30 will have activity within their RPA. Where the RPA and proposed driveway overlap, construction will be under the guidance of the project arborist and is likely to include no-dig/raise to a level construction using honeycomb/cellular mattresses backfilled with inert, fines-free shingle.
- 2) All service runs, run-off control areas, changes in drainage, levels or gradients, site storage, temporary parking, offices, loos, access routes (and any similar impacts) will be confined to within the construction area defined by tree protection fencing as shown in Appendix 5. If this is subsequently considered impractical other routes/areas may be allowed but only if approved in writing by the project arborist (probably in consultation with the local authority Tree Officer).
- 3) Devise a pollution prevention plan in line with the COSHH Regulations and the Environment Agency's Pollution Prevention Guidelines series and incorporate it into the project layout.
- 4) Once planning permission has been obtained, conduct any tree work recommended by the AIA and TPP.
- 5) Erect tree protection fencing and get it approved by a competent arborist. This must happen before any work on site starts (apart from that mentioned in item 4 above), unless it has been approved in writing by a competent arborist. The fencing standard must be that shown in Appendix 5.
- 6) Ensure tree protection fence lines and types integrate with fences needed for other purposes (security, ecology). In this case, reptile fencing will need to be on the unaffected side of the tree protection fence.
- 7) Commission a competent arborist for a regime of site inspections and an end-of-project letter/report to be submitted to the local authority, stating that the Tree Protection Plan was complied with.
- 8) Plant new trees.

8 Appendices.

8.1 Appendix 1. Tree Survey List

ID #	species	overall height in metres	significant limb in metres (and orientation)	height of canopy base in metres	DBH (cm)	canopy extent				maturity	vigour	structure	form	expected useful life	BRP	BS5837 category	RPA (radius of circle in cm)	comments
						N	E	S	W									
1	<i>Cordyline australis</i>	4.5	2.5 (S)	2.5	29	1.5	1.5	1.5	1.5	m	gd	gd	gd	20-30	L	C	348	
2	<i>Eucalyptus sp</i>	8	2 (SW)	4.5	89	4	4	4	4	m	gd	fr	pr	30-40	M	C	1068	Coppiced approximately 15years ago and pollarded in last few years. Extensive rot/cavity at base - suspect it extends up. TF at 1.5m
3	<i>Griselinia littoralis</i>	4	n/a	0	19	1.5	1.5	1.5	1.5	sm	gd	fr	fr	<10	L	C	190	Scrappy shrub at base of wall
4	<i>Ilex aquifolium</i>	5	2 (S)	2	10, 15	1	1	1.5	1	sm	gd	fr	pr	<10	L	C	220	Scrappy shrub at base of wall
5	<i>Pittosporum tenuifolium</i>	6	n/a	2	21	1.5	1.5	1.5	1.5	sm	fr	fr	fr	10-20	L	C	252	TF at 1.5m
6	<i>Prunus avium</i>	6	3 (S)	3	18, 17	2	3	3	2	sm	fr	fr	pr	10-20	L	C	300	Poor form (stem nearest boundary has been topped at 3.5m).
7	<i>Pittosporum tenuifolium</i>	6	n/a	2	11, 10	2	2	2	2	sm	gd	gd	gd	10-20	L	C	180	Good specimen.
8	<i>Pinus nigra</i>	14	5 (W)	6	56	4.5	6	5	5.5	m	gd	gd	gd	30-40	L	B	672	Good specimen. Significant in local landscape.
9	<i>Pinus nigra</i>	12	6 (E)	6	56	4	8	4.5	1	m	fr	fr	gd	10-20	L	C	672	OK in current setting but leans to E and most of canopy to E. Suspect lifting rootplate. Should not be retained if buildings are constructed to E of it.
10	<i>Picea sitchensis</i>	11	n/a	2	36	2	3	5	2.5	sm	pr	fr	fr	10-20	L	C	432	Poor vigour. Sparse foliage. Limited amenity value.
11	<i>Prunus avium</i>	7	5 (S)	5	54	2	0	4	5	om	fr	bd	bd	<10	M	C	648	A remnant stem with sparse canopy. Some wildlife value but very limited amenity value.
12	<i>Quercus robur</i>	9	2 (S)	2.5	41	1	5	5	2.5	sm	pr	pr	pr	<10	M	C	492	Almost dead. Some cavities. Leans E slightly.
13	<i>Quercus robur</i>	10	3.5 (E)	4	85?	5?	5?	5?	5?	m	gd	gd	fr	40+	L?	A	1020?	Veteran tree off site. Dimensions/location estimated from a distance. Recently

																		reduced.
14	<i>Malus var.</i>	6	1 (S)	2	35?	3?	3?	3?	3?	m	gd	fr	gd	10-20	L	C	0	Well-managed apple off site. Dimensions/location estimated from a distance.
15	<i>Pittosporum tenuifolium</i>	7.5	n/a	2	#	3	3	3?	3	m	gd	fr	fr	<10	L	C	252	Off site. Approx. 10 stems, av. 10cm?
16	<i>Fagus sylvatica</i>	9	?	2	28?	3.5	3.5	3.5?	3.5	sm	gd	fr	fr	40+	L	B	336	Off site. Good potential.
17	<i>Quercus robur</i>	11	3.5 (SW)?	3	70?	6	5	5?	5	m	fr	fr	fr	40+	L	B	810	Off site. Ok specimen with good potential.
18	<i>Cupressus macrocarpa</i>	17	3	3	110?	4?	8?	8?	4?	m	fr	pr	fr	<10?	L?	B	1212	Off site. Good specimen. However, has been badly pruned, has dumping around base, new fence erected through its root zone and adjacent similarly sized tree recently. felled, so concerned that it may fail in the not-to-distant future
19	<i>Cupressus macrocarpa</i>	13	6	14	56	5.5	5	4	7	m	gd	fr	fr	10-20*	L	B	672	Prominent in local landscape. Slight lean along property boundary to E and twisted stem but seems to have grown this way. Large malformed limb on S side with included growth.
20	<i>Picea sitchensis</i>	12	n/a	1.6	31	4	3	3	3	sm	pr	pr	pr	10-20	L	C	372	Poor vigour. Sparse foliage. Limited amenity value. LLD.
21	<i>Prunus avium</i>	6	n/a	1	21	3	3	3	3	im	fr	fr	fr	<10	L	C	252	Possible sucker re- growth from 25.
22	<i>Pinus nigra</i>	14	10 (NE)	10	46	3	3	3	3	m	gd	gd	gd	20-30	L	B	552	LLD but nice specimen.
23	<i>Carpinus betulus</i>	7	1.2 (NE)	2	11, 9	3.5	4	2	3	im	gd	fr	pr	<10	L	C	170	Leaning to NE.
24	<i>Prunus avium</i>	7	2 (E)	2	18	3.5	4	3	3	im	gd	gd	gd	10-20	L	C	216	Possible sucker re- growth from 25.
25	<i>Prunus avium</i>	4	2 (N)	2	48	4	3	0	0	om	pr	bd	bd	<10	M	C	576	Mostly dead.
26	<i>Prunus avium</i>	6	2 (NW)	2	17	4	4	3	3	im	gd	gd	gd	40+	L	C	204	Possible sucker re- growth from 25.
27	<i>Quercus robur</i>	11	3 (S)	3	70?	6	8	6	4	m	fr	fr	fr	40+	L	A	840	Mature oak on neighbouring property. Significant in local landscape.
28	<i>Quercus robur</i>	11	5 (W)	5	44	4	4	2	3	sm	fr	fr	fr	40+	L	B	528	DB1+2. Frontage tree but not great form.
29	<i>Quercus robur</i>	10	2 (SE)	2	52, 37	7	6	2	4	sm	fr	fr	fr	40+	M	B	770	DB1+2. Frontage tree but not great form. Crevices.
30	<i>Quercus robur</i>	8	2.5 (SE)	2.5	42	4	5	4	4	m	gd	fr	gd	40+	L?	B	504	Extensive ivy

31	<i>Betula pendula</i>	8	n/a	1	11	1	2	1	1	im	gd	gd	gd	10-20	L	C	132	Slight lean to SE but seems to have grown that way to avoid 30.
32	<i>Pyrus communis</i>	4	2 (S)	2	26	2	2	2	2	m	gd	fr	fr	10-20	L	C	312	
33	<i>Fraxinus excelsior</i>	9	2.5 (N)	2	18	4	4	2	4	im	vg	vg	vg	40+	L	B	216	Good specimen. Small but with potential.
34	<i>Pyrus communis</i>	3	n/a	n/a	14, 16, 19	1	2	2	2	m	gd	fr	fr	10-20	L	C	340	
35	<i>Malus var.</i>	4	0.5 (n/a)	n/a	12, 12, 17, 10	2	3	3	2	m	gd	fr	fr	10-20	L	C	310	
36	<i>Pittosporum tenuifolium</i>	4	0 (N)	1.5	8, 14	1	1	1	1	sm	gd	fr	fr	10-20	L	C	190	
37	<i>Robinia pseudoacacia</i>	5.5	1.5 (S)	2	22	2	2	2	1	sm	fr	pr	pr	10-20	L	C	264	Topped a few years ago. Some loose bark.

Key to Tree Survey List

U = Unsuitable for retention.

A = Category A trees (especially good specimens).

B = Category B trees (poorer trees or good young trees)

C = Trees with only a decade or so of useful life.

Maturity on a scale of **immature**, **semi-mature**, **mature** and **over-mature**

Bat Roost Potential on a scale of **Low**, **Medium**, **High** (see Appendix 6 for an explanation of these relative terms).

Vigour, **Structure**, **Form** on a scale of **bad**, **poor**, **fair**, **good**. These are relative terms and should not be used to infer that a tree is safe (or not) or suitable for retention (or not).

RPA = Root Protection Area.

LLD = Lost Leader Dominance

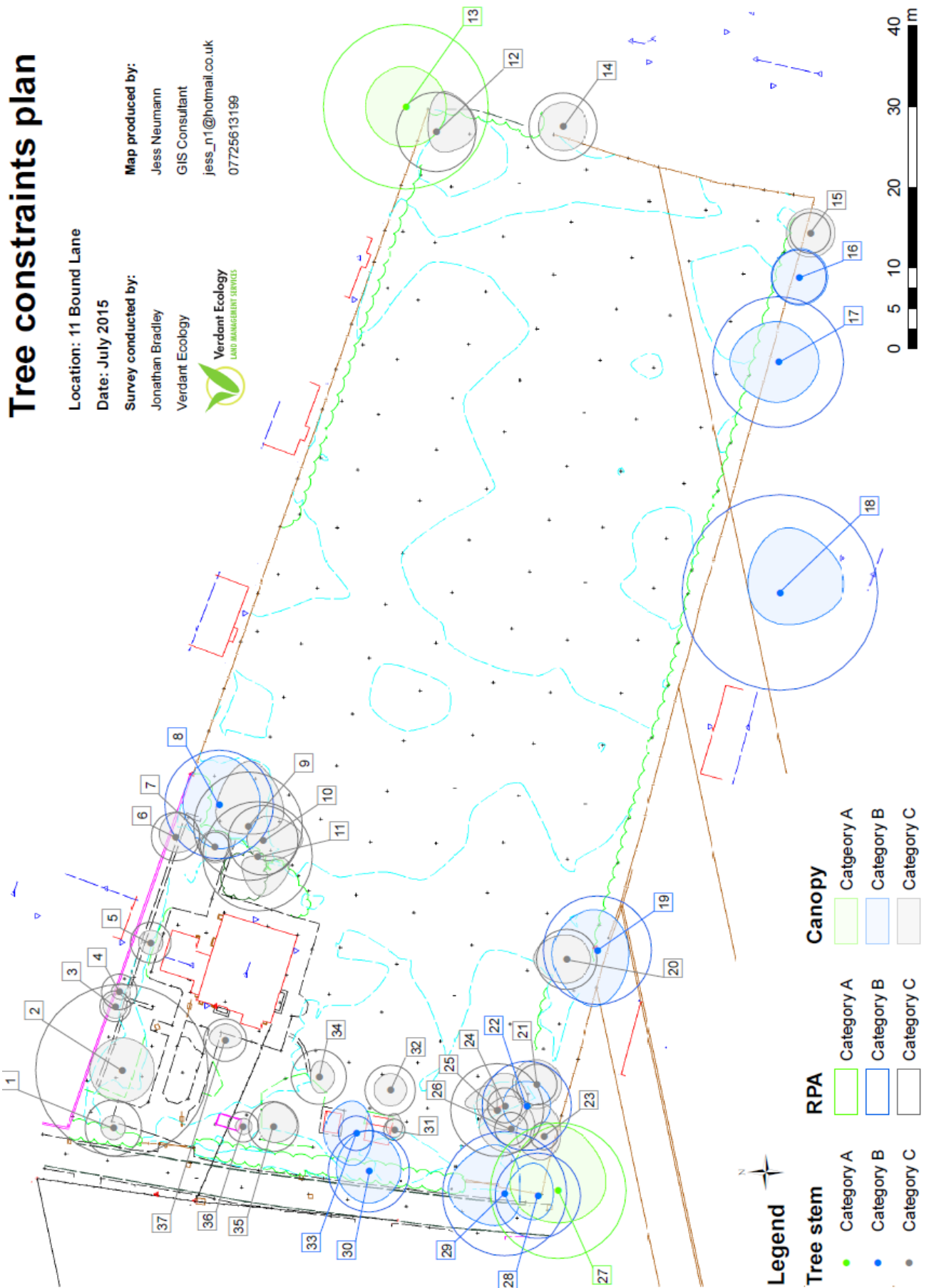
TF = Tight Fork

DB = Dieback (1 = twigs, 2 = branches, 3 = limbs, 4 = stem(s)).

= See comments section.

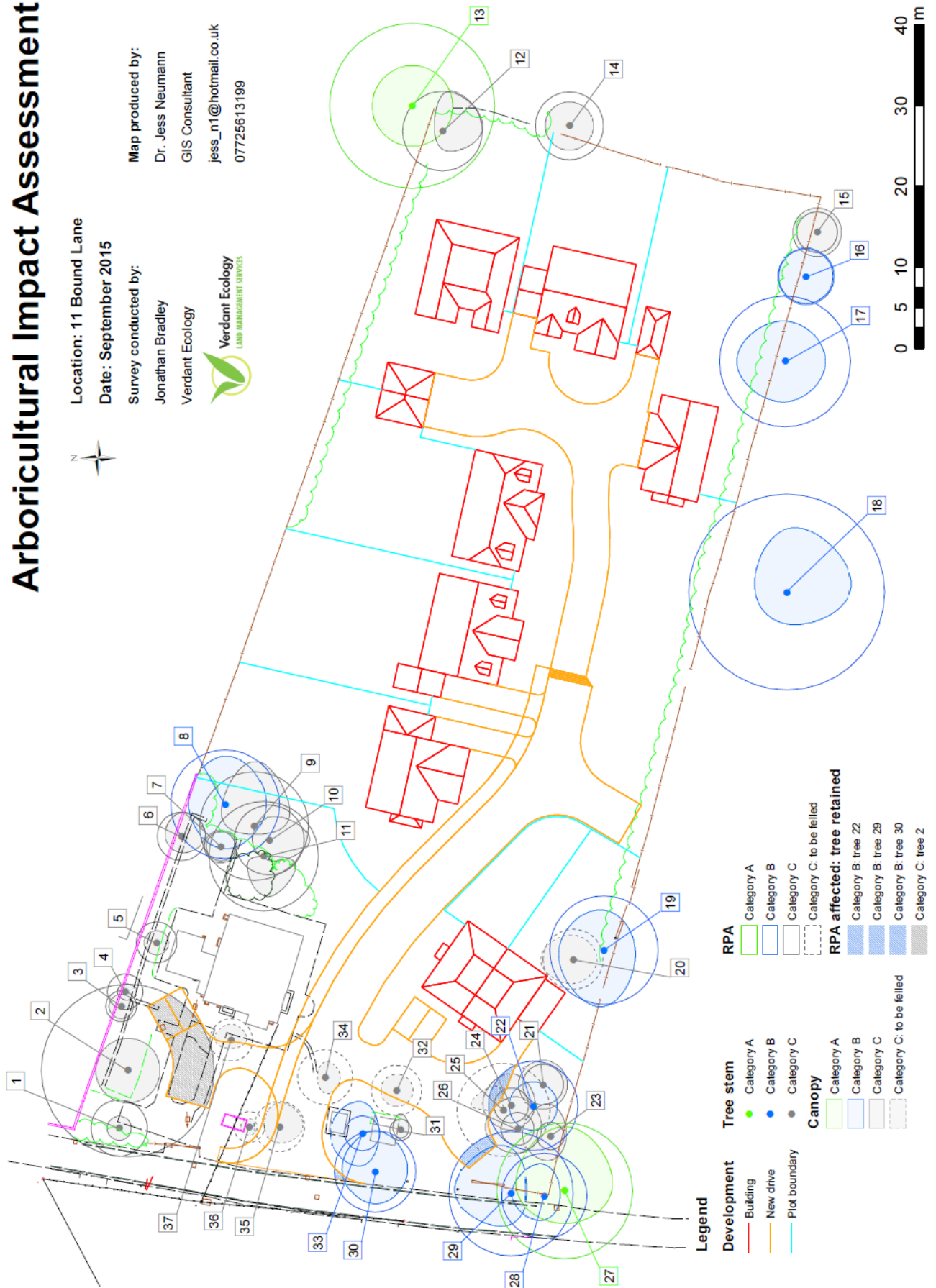
? = dimension was estimated from a distance (i.e. on inaccessible land).

8.2 Appendix 2. Tree Constraints Plan

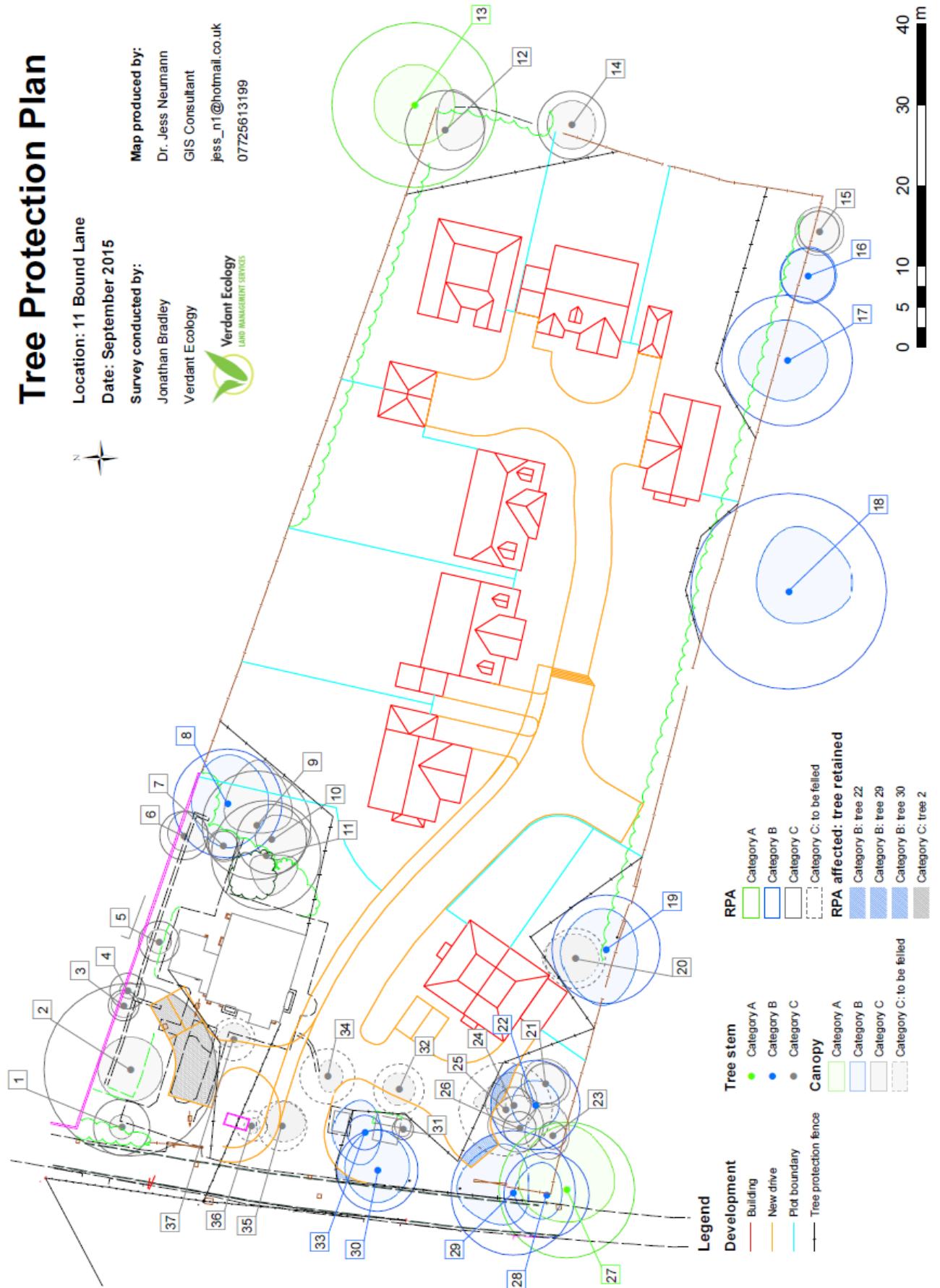


8.3 Appendix 3. Arboricultural Impact Assessment Plan

Arboricultural Impact Assessment

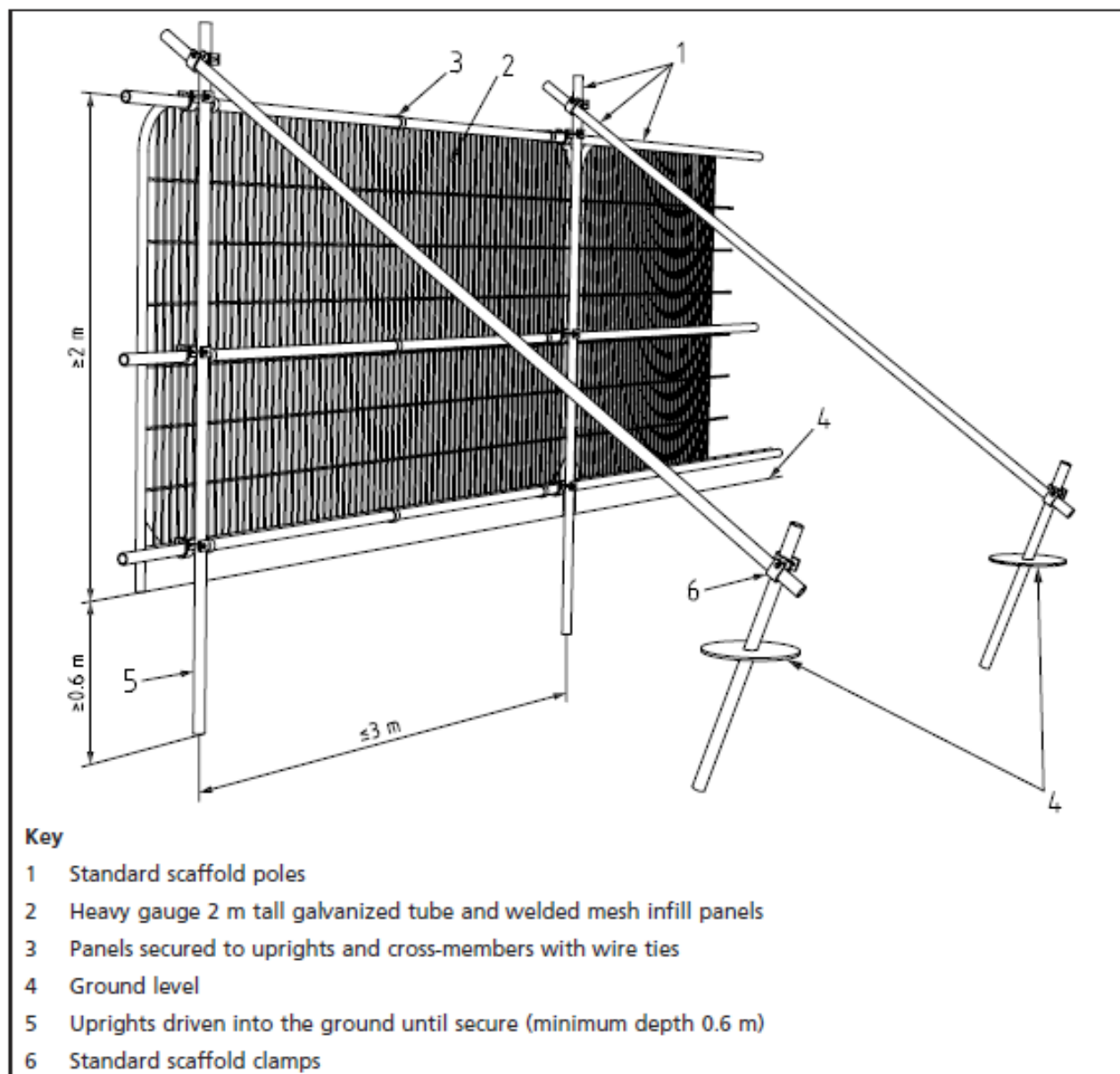


8.4 Appendix 4. Tree Protection Plan



8.5 Appendix 5. Tree Protection Fencing Specification

Figure 2 Default specification for protective barrier



8.6 Appendix 6. System for Bat Roost Potential Categorisation.

Notes.

These categories do not necessarily correspond directly to those in the table in the Bat Conservation Trust's 2012 guidelines. We suggest that our 'High' category includes both the BCT categories 1* and 1, our 'Medium' approximates to their 2 and our 'Low' to their 3. Where survey is limited in some way (such as rain shower, bright sunshine, extensive ivy, obscuring foliage), this will be noted and/or the category upgraded on precautionary principles.

Table 2. System for Bat Roost Potential Categorisation

	<u>Example results of survey</u>
Roost found	Positive evidence of bats found (bats, squeaking or droppings) or evidence that would be reckless to dismiss (insect wings).
High BRP	Tree located in likely spot. Tree has one or more than one, really good feature or has many fairly suitable ones. Evidence that possibly isn't bats but that would be reckless to ignore (polishing, staining). Trees with sections that cannot be seen properly from the ground but where there is strong suspicion there might be a feature there.
Medium BRP	Either; Tree has bat roost features but in extremely unlikely location. Or; Tree in good habitat but crevices gaping/superficial/minor/ exposed or flaky bark of limited extent.
Low BRP	Tree generally in good structural condition and/or in unsuitable location.

8.7 Appendix 7. References

- **British Standard 5837 (2012).** Trees in Relation to Design, Demolition and Construction: Recommendations. British Standards Institute, London.
- **NJUG Vol. 4 (2007).** Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.