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**ARBORICULTURAL IMPLICATIONS ASSESSMENT
FOR
PROPOSED SINGLE STOREY EXTENSION**

AT

**BONFIRE COTTAGE
BONFIRE LANE
HORSTED KEYNES**

BY

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2. TREE CONSTRAINTS PLAN, DRAWING NO. J66.58/01
3. TREE PROTECTION PLAN, DRAWING NO. J66.58/02

1. INTRODUCTION

- 1.1 Broad Oak Tree Consultants Ltd. received instructions from Mr & Mrs Lewis to undertake an inspection of trees located immediately adjacent to the site referred to as Bonfire Cottage, Bonfire Lane, Horsted Keynes. 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 the construction of a single storey extension to the rear to form a breakfast/dining room. Details of the proposals will have been submitted by David Jenkins Design.
- 1.3 The trees were inspected on 5th March 2025 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 Bonfire Cottage is a semi-detached two storey house located on the south side of Bonfire Lane in a level plot, with gardens to the east and south. To the south the garden is mainly down to stone and paving with border planters and a shed. Beyond the boundary fence to the south are the grounds of further residential properties with a number of trees of varying dimensions.

3. SCOPE OF TREE SURVEY

- 3.1 No trees are located within the grounds of Bonfire Cottage.
- 3.2 The trees and hedges in the adjoining grounds of potential influence on the proposals were located using a hand held laser range finder.

4. DATA COLLECTION

- 4.1 All trees were remotely viewed and dimensions estimated. Each tree was inspected to the requirements of Section 4.4 "Tree Survey" 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 G6 inclusive. Tree numbers, together with BS recommended colour coding of condition, have been added to the Tree Constraints Plan, our drawing no. J66.58/01 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. A separate detailed tree survey sheet is 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 five individual trees and one evergreen hedge were recorded, all located within adjoining grounds. The Bay, T1, is unusually large for the species, being multi stemmed with an open crown, raised and reduced in the past.
- 6.2 Trees T2, T4 and T5 have been planted in the past 40 years with variable levels of canopy reduction undertaken, some in recent months.
- 6.3 T3 Fig is a small tree growing against the adjoining boundary fence, very heavily reduced in recent months.
- 6.4 G6 Mixed Species is a well maintained boundary hedge.
- 6.5 All appear in reasonable health.
- 6.6 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	T1	1
C	T2, T3, T4, T5, G6	5
U	-	-
	TOTAL	6

6.7 *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 redevelopment proposals.

Tree no.	Species	BS Category	Stem diameter or calculated equivalent (mm.)	BS calc. radial equiv. root protection area (m.)	BS calc. total RPA (m²)
T1	Bay	B2	c900	c10.8	c366
T2	Field Maple	C2	c400	c4.8	c72
T3	Fig	C2	150	1.8	10
T4	Sorbus sp	C2	c250	c3	c28
T5	Sycamore	C2	c350	c4.2	c55
G6	Mixed Species	C2	<100	<1.2	<5

ARBORICULTURAL IMPLICATIONS ASSESSMENT

8. DEVELOPMENT PROPOSALS

- 8.1 The proposals are for the construction of a single storey extension to the rear to form a breakfast/dining room. Details of the proposals will have been submitted by David Jenkins Design.
- 8.2 The supplied proposed site layout produced by David Jenkins Design has been used as the base for the Broad Oak Tree Consultants Ltd. Tree Protection Plan, drawing no. J66.58/02 in Appendix 3. This indicates measures to minimise potential impacts on neighbouring trees in accordance with BS5837:2012 requirements.

9. POTENTIAL IMPACT OF PROPOSALS ON TREES

- 9.1 No trees require removal for the proposals.
- 9.2 No trees require tree surgery works for the proposals.
- 9.3 The only potential impacts relate to possible root presence from trees T1-T3 within the area of the proposed extension. The foundation design has taken in to account the possible presence of tree roots.
- 9.4 To minimise ground disturbance the foundations to the extension will comprise screw or mini piles, which can be installed by manually operated drivers or under 1 tonne mobile rigs. A reinforced slab will be set on the pile heads at ground level, utilising the existing depth of the paving and their sub-base. Ground disturbance will be limited to the diameter of the piles with no pressure from the slab on the soils. As a lightweight structure this form of minimal ground intervention design will ensure nominal potential for root disturbance.
- 9.5 This approach to foundation design is indicated on the Tree Protection Plan and accords with the recommendations Section 7.5 "Special Engineering for foundations within the RPA" of BS5837:2012. As such the principle should be acceptable to the Council.
- 9.6 The slab formation will be plastic lined to avoid any spillage or leachates from the concrete entering the soil.
- 9.7 The concrete will either be piped in or mixed in a bunded working space to avoid any spillages.
- 9.8 These precautions are also indicated on the Tree Protection Plan.
- 9.9 Electrical feeds will be keyed in to those within the house and roof drainage will be linked in to the existing rainwater downpipe system, avoiding any requirement for excavations for services or drainage.
- 9.10 Overall the proposals will not have an adverse impact on the root systems of any adjoining trees, provided the appropriate foundation design and work methodologies are applied.

10. TREE PROTECTION MEASURES

- 10.1 No specific tree protection fencing is necessary. The boundary fences protect the offsite trees from any accidental contact damage.
- 10.2 The stone and paved area to the rear of the house provides sufficient load bearing capacity for foot traffic.
- 10.3 As this is a very small development all materials will be walked in around the house, with materials supplied on an “as and when needed” basis.

11. SUMMARY

- 11.1 The proposed single storey extension does not require any tree removal or tree surgery works.
- 11.2 Potential impacts on Third Party tree root systems have been mitigated through foundation design, in accordance with BS5837:2012 recommendations.
- 11.3 Due to the small size of the proposals risks to trees from contact damage or ground compaction are minimal due to site circumstances and materials being walked in to site.
- 11.4 The Tree Protection Plan can be referred to as an approved plan in a specifically worded Condition to ensure the appropriate foundation design and precautions 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 Semi Mature - SM 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	- 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							
T1	Bay	11	Multi	c900	6	7	c5	5.5	M	3.5+	Unconfirmed	20-40	B2	Multi-stemmed near ground level. Open crown. Past crown raising. Minor deadwood and crown thinning	
T2	Field Maple	7	1	c400	4.5	2	<5	4	M	2.2+	Unconfirmed	20-40	C2	Heavily reduced in past on several occasions. Crowded to E	
T3	Fig	2.6	Multi	150	2	0	1.5	2.5	Y	1.5+	Fair	20-40	C2	Heavily reduced recently. Multi-stemmed <1.5m	
T4	Sorbus sp	8	3	c250	3	4	<4	2	SM	2+	Unconfirmed	20-40	C2	Crowded. Three stems <2m	
T5	Sycamore	7	5	c350	3.5	2.5	c4	c4	SM	2+	Unconfirmed	20-40	C2	Part reduced in past year. Multi-stemmed <2m. Previously heavily reduced	
G6	Mixed Species	<2.5	Multi	<100	<1	<1	<1	<1	M	0+	Good	40+	C2	Mixed species evergreen hedge. Regularly maintained	

APPENDIX 2

BONFIRE COTTAGE
BONFIRE LANE
HORSTED KEYNES

TREE CONSTRAINTS PLAN

T1 - G6 Tree numbers

BS Category of Condition

BS Condition A

BS Condition B

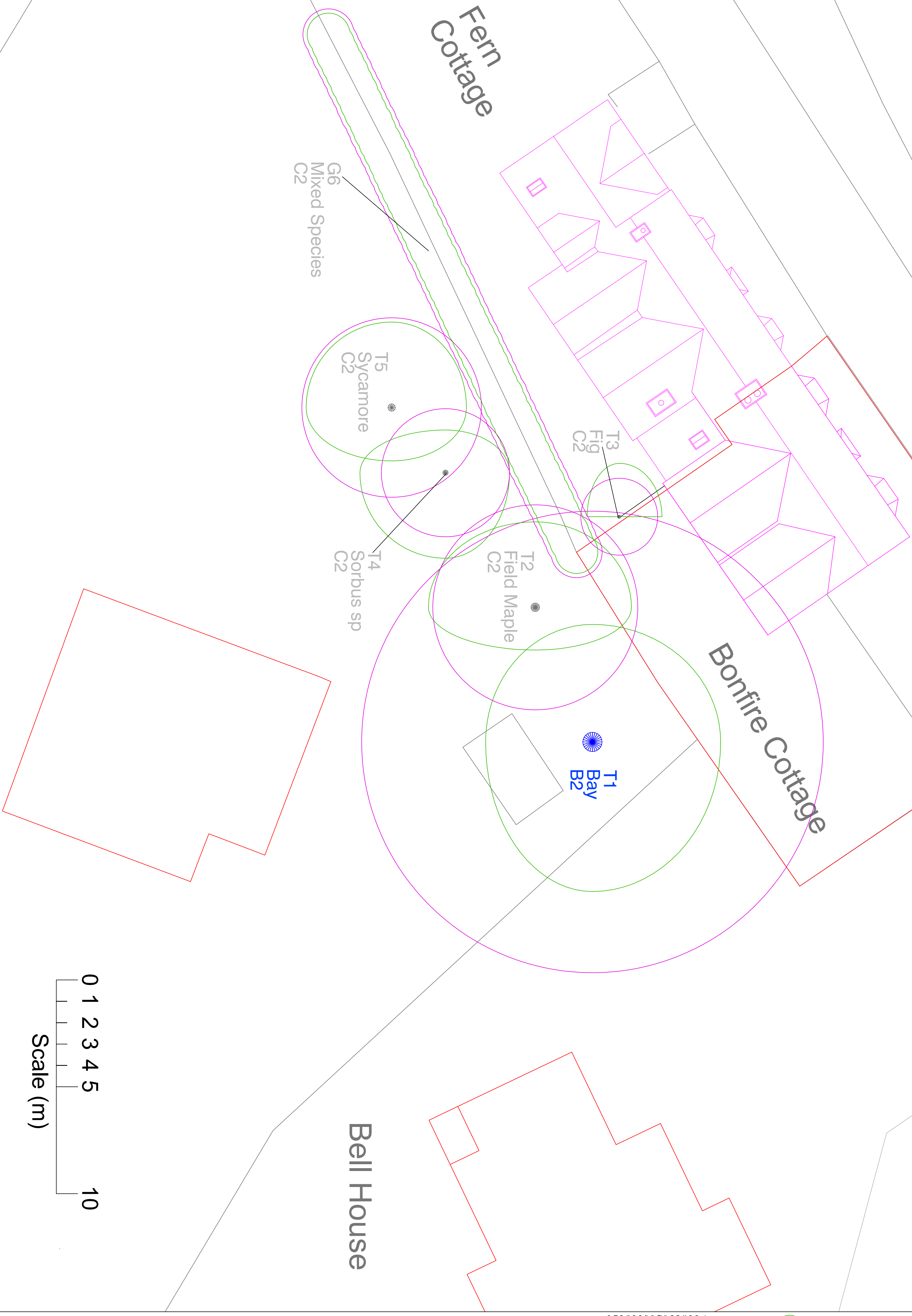
BS Condition C

BS Condition U

Crown spread

BS Calculated root protection areas

The root protection areas have been calculated using the measured stem diameter and the crown spread of the trees as represented as basic circles on the plan. The areas are not intended to represent the actual services and hard surfacing with the indicated RPA's. It is likely that the actual root spread of the trees may be greater than the indicated RPA's. The areas are intended to provide a guide to the likely extent of the root spread. The areas are not intended to be used as a basis for the design of the underlying soils. In the absence of detailed site investigations, the indicated root protection areas are intended only with any redevelopment proposals.



APPENDIX 3

BONFIRE COTTAGE
BONFIRE LANE
HORSTED KEYNES

TREE PROTECTION PLAN

T1 - G6 Tree numbers

BS Category of Condition

- 0** BS Condition A
T1 BS Condition B
T2 BS Condition C
0 BS Condition U

- Crown spread**
BS Calculated root protection areas

- Tree to be removed for safety/short lifespan**
Tree to be removed for development

- Protective fencing location**
Ground protection

TREE PROTECTION INFORMATION
Protective fencing and ground protection measures to be installed at commencement of any demolition works.
Protective fencing to comprise:
- Reddish panels securely fixed to wooden posts at 1m intervals
- 100mm x 100mm x 10mm rubber/plastic feet to form a continuous barrier. Feet to be pinned to the ground with road pins/nails spaced base or top to top at 1m intervals.
- Signs to be attached to every 5th panel reading: "TREE ROOT PROTECTION ZONE - KEEP OUT" in similar wording to BS5837:2012.

Ground protection measures to comprise a single thickness of side cutting scaffold boards over a 100mm gableable. For machinery access, interlocking metal/plastic road plates will need to be used.

Buildings in proximity to protective fencing areas to be demolished by the building contractor. The fenced protection zones around retained trees, hedgerows and scrubland are to be regarded as sacrosanct and any work within these areas:

- Storage or disposal of any soil, spoil or debris on or near the site or waste residues of any description.
- Siting of any temporary structures of office/site buildings, temporary car parking facilities, porta-loos, storage compounds or temporary hard standing areas.
- Excavations, soil/lift stripping, ranspawning of existing levels or surface/ground conditions of any other description.
- Location of temporary drainage supplies or any other temporary underground services.
- No use, movement or parking of any machinery or vehicles of any description.

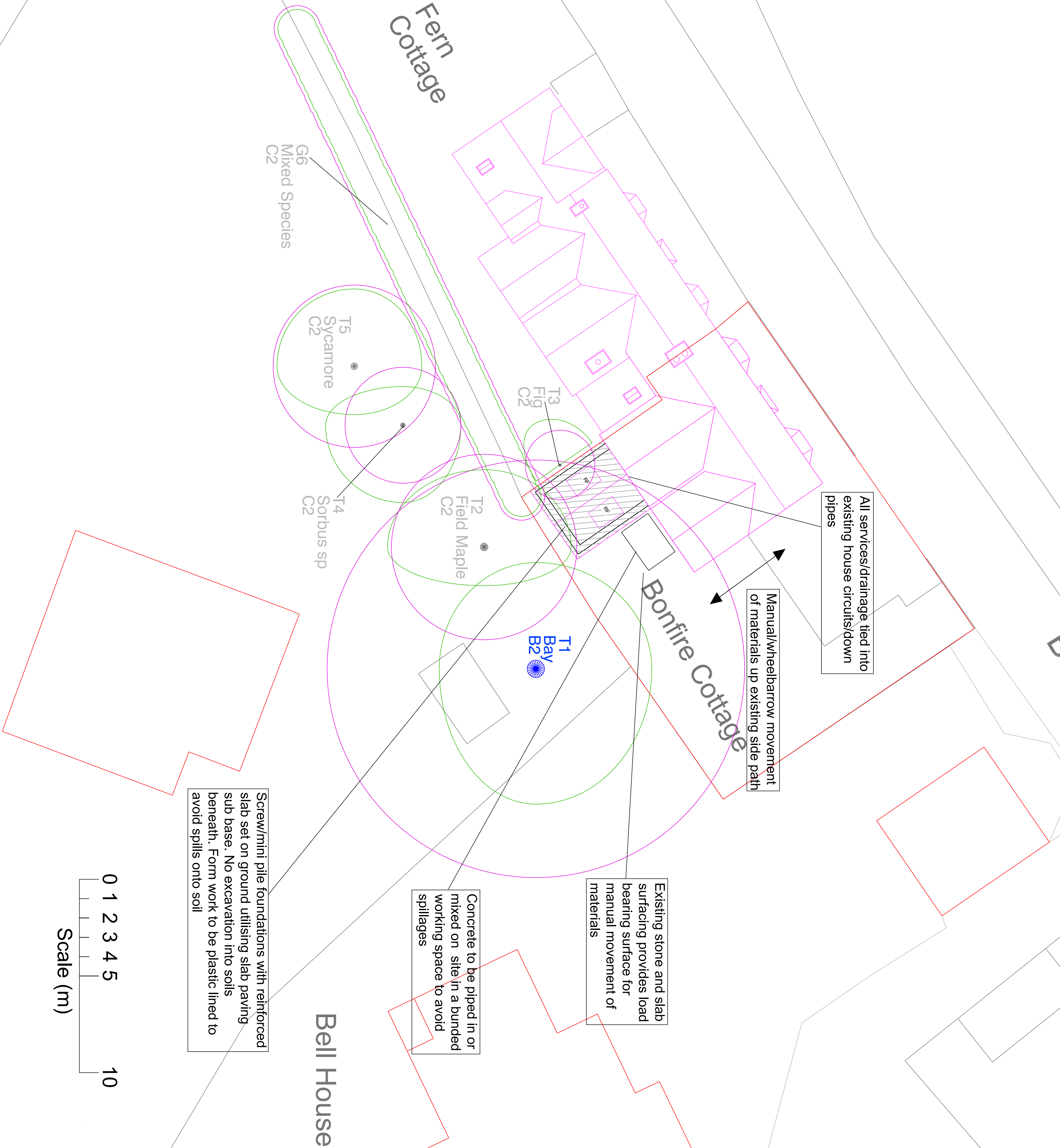
- Additionally, no fires shall be lit within 20m, of the trunks of any trees or the centre line of any hedgerow to be retained.
All services to be installed to the requirements of NALUG Volume 4 (Electricity, Gas, Water, Sewerage, Telecommunications and Maintenance of Utility Apparatus in Proximity to Trees". Any runs within retained trees root protection zones shall be supervised by the Arboricultural Consultant.

DRAWING NO. J66.58/02

Scale: 1:100 at A1

Added to by: NL

09/03/2025



All services/drainage tied into existing house circuits/down pipes

Manual/wheelbarrow movement of materials up existing side path

Bonfire Cottage

Existing stone and slab surfacing provides load bearing surface for manual movement of materials

Concrete to be piped in or mixed on site in a bunded working space to avoid spillages

Screw/mini pile foundations with reinforced slab set on ground utilising slab paving sub base. No excavation into soils beneath. Form work to be plastic lined to avoid spills onto soil

Bell House

Fern Cottage

G6 Mixed Species C2

T5 Sycamore C2

T4 Sorbus sp C2

T2 Field Maple C2

T3 Fig C2

T1 Bay B2

0 1 2 3 4 5 10
Scale (m)