



Broad Oak Tree Consultants Limited

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ARBORICULTURAL IMPLICATIONS ASSESSMENT FOR PROPOSED EXTERNAL TERRACE

AT

**ZERODEGREES
NO. 9 BRIDGE STREET
READING
RG1 2LR**

BY

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CONTENTS

Page No.

1.	INTRODUCTION	1
2.	GENERAL SITE DESCRIPTION	1
3.	SCOPE OF TREE SURVEY	1
4.	DATA COLLECTION	1
5.	RISK ASSESSMENT - INFORMATIVES	2
6.	RESULTS OF TREE INSPECTIONS	3
7.	BS CALCULATED ROOT PROTECTION AREAS (RPAs)	4
ARBORICULTURAL IMPLICATIONS ASSESSMENT		
8.	DEVELOPMENT PROPOSALS	5
9.	TREE SURGERY REQUIREMENTS	5
10.	POTENTIAL IMPACT OF PROPOSALS ON TREES	5
11.	TREE PROTECTION MEASURES	6
12.	SUMMARY	6

APPENDICES:

1. EXPLANATORY SHEETS, TREE INSPECTION SHEET
2. TREE CONSTRAINTS PLAN, DRAWING NO. J54.36/01
3. TREE PROTECTION PLAN, DRAWING NO. J54.36/02

1. INTRODUCTION

- 1.1 Broad Oak Tree Consultants Ltd. have received instructions through Design LSM to undertake an inspection of trees located on and immediately adjacent to the site referred to as Zerodegrees, No. 9 Bridge Street, Reading, RG1 2LR. 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 new exterior Terrace to provide outdoor seating and dining with composite timber deck, steel guardrail and three interconnecting Jumbrellas. Details of the proposals will have been submitted by Design LSM Architects.
- 1.3 The trees were inspected on 9th August 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 Zerodegrees is a restaurant and microbrewery occupying a glass and steel two storey building with basement level on the east side of Bridge Street, just south of its junction with Gun Street. It is located in a heavily built up commercial sector with a small area of open space to the south between the restaurant building, a turning head and small access road to the rear of various commercial buildings.
- 2.2 The open space comprises a rectangle of grass with two young trees alongside the pavement either side of a bench. To the east side of the turning head are two young but vigorous developing trees in a narrow section of open ground.

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.

4. DATA COLLECTION

- 4.1 All trees were inspected from the ground and no climbing or specialist investigations were undertaken. 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 T3 inclusive. Tree numbers, together with BS recommended colour coding of condition, have been added to the Tree Constraints Plan, our drawing no. J54.36/01 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 3 individual trees were inspected, all three of which have been planted in the last 30 years as part of several phases of landscaping. T1 Red Oak has been planted in the past 5 years or so and has an open developed crown of slender branches. Its upper apical dominance has been lost and the pendular upper limbs have rounded out the canopy. To the south side of the bench is a further young standard tree that appears to have been dying since being planted and is virtually dead.
- 6.2 T2 is a very vigorous London Plane, planted to screen the brick wall of a building to the east. Its rapid growth and limited space to the east has resulted in a slight stem lean to the west. Its outer canopy also hangs quite low over the turning head and outer limbs to the north are almost touching the restaurant cladding.
- 6.3 It is presumed that the tree was intended to be allowed to develop to a certain size and then maintained, as the space is not viable for the tree's potential mature size without significantly over dominating the space and the restaurant. It is also limiting the development of T3 Wild Cherry to the south. Ideally the tree should be reduced quite heavily, an operation tolerated well by the species, and maintained on a regular pruning cycle similar to most Planes in London and other built up areas.
- 6.4 T3 Wild Cherry has developed an asymmetric form due to the rapid expansion of T2 and is of limited presence, though appearing to be in reasonable health. A girdling root at its base to the north/northeast will be restricting its anchorage in this direction and maintaining its canopy would reduce loading on this weak zone.
- 6.5 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	2	1
C	1, 3	2
U	-	-
	TOTAL	3

6.6 *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	Red Oak	C2	140	1.7	9
2	London Plane	B2	430	5.2	85
3	Wild Cherry	C2	320	3.8	45

ARBORICULTURAL IMPLICATIONS ASSESSMENT

8. DEVELOPMENT PROPOSALS

- 8.1 The proposals are for the construction of a new exterior Terrace to provide outdoor seating and dining with composite timber deck, steel guardrail and three interconnecting Jumbrellas. Details of the proposals will have been submitted by Design LSM Architects.
- 8.2 The supplied "Existing & Proposed Ground Floor Terrace Plan" produced by Design LSM, drawing no. 02-06 Rev A has been used as the base for the Broad Oak Tree Consultants Ltd. Tree Protection Plan, drawing no. J54.36/02 in Appendix 3. This indicates measures to protect retained trees during the proposed works in accordance with BS5837:2012 requirements.

9. TREE SURGERY REQUIREMENTS

- 9.1 The canopy of T2 London Plane is dense and hangs down to within 1m of ground level in places. As indicated in the above results section the tree is overdue for a crown reduction as it is inappropriately located to be able to develop to its full mature potential.
- 9.2 At a minimum it would be necessary to raise the crown base to 4m from ground level and trim back fine outer branches to the north to provide a reasonable maintenance gap to the restaurant exterior. This would involve removing one circa 15cm diameter limb; one circa 10cm diameter limb and a number of fine branches. Such works would not adversely affect the health of the tree, which is a vigorous specimen and of a species well known for its resilience to pruning.
- 9.3 Ideally the tree should be reduced all over by circa 6m height, crown raised and the canopy reduced back to a scaffold framework of no more than 3m to the north, south and west and back by 1m to the east to produce a core structure. Rapid regrowth would be anticipated and re-reduction on a circa 5 year cycle would be envisaged. This would be a reasonable maintenance program for such a tree, whether or not the proposed Terrace goes ahead. However, as the tree is Council owned this would be dependent on what management program they have in place.

10. POTENTIAL IMPACT OF PROPOSALS ON TREES

- 10.1 No trees require removal for the proposed Terrace.
- 10.2 The Terrace will be supported off beams running just above existing ground level. The beams will be supported off a network of posts. The post locations will be hand tool excavated or augered using a hand held auger. Should any roots of 25mm diameter or greater be encountered the holes will be locally relocated. If a hand held power auger is used this will typically stop on encountering roots of 15+mm diameter.
- 10.3 All holes will be dug to the minimum dimensions necessary, as contractors will not typically hand dig any hole any bigger than the absolute minimum necessary due to the effort involved.
- 10.4 This approach will allow the vast majority of the root system of the Plane to remain beneath the Terrace undisturbed.

- 10.5 The slightly raised nature of the decking will allow continued gaseous exchange with the soil beneath and any rainfall will drain off the deck boards to the ground below, meaning no changes in water availability.
- 10.6 Overall, provided the installation works are appropriately controlled, the proposed Terrace will only have a nominal impact on the London Plane, T2 and this would not represent a significant arboricultural grounds for refusal.

11. TREE PROTECTION MEASURES

- 11.1 The main risk to the trees from the Terrace installation would be compaction of soils. As such, appropriate ground protection measures will be required to protect the soil structure during the installation works. No machinery access is necessary so any compaction risk relates to foot fall only. Materials will be supplied in on a daily basis to minimise the risk of theft.
- 11.2 As a weed suppressant layer will be required this can be combined with ground protection measures. A geo-membrane base layer will be laid once the turf has been removed by hand tools. Over the geo-membrane a 75mm layer of roadstone will be laid. This will act as a weed suppressant and support foot traffic.
- 11.3 The support posts will be dug through the ground protection layer and cross beams set on or in the roadstone.
- 11.4 To avoid potential ground compaction to soils outside of the footprint of the Terrace weldmesh panels, similar to Heras products, would be erected along the turning head pavement edges past T1 and alongside T2 and T3. However as this is Council owned land this would be subject to their approval.
- 11.5 No services or drainage is required so there would be no ground disturbance beyond the hand tool located support posts.

12. SUMMARY

- 12.1 The proposed Terrace would not require any tree removal.
- 12.2 The canopy of the London Plane, T2 will require lifting and reducing back from the building. As this overhangs the ownership of the restaurant these works could be undertaken under Third Party Rights whether or not the Terrace was proposed.
- 12.3 The Terrace deck is proposed to be suspended above existing ground level so that only support posts would require excavation. These will be hand dug and locally revised if roots over 25mm diameter are encountered. Potential disturbance to tree roots is therefore minimal with nominal changes to gaseous exchange and moisture availability that will not impact on the health of the Plane tree.

- 12.4 Ground protection measures will be provided which will also provide weed suppression beneath the Terrace to avoid soil compaction during construction works.
- 12.5 Overall the potential impact on trees present is considered nominal and should not represent grounds for refusal. The Tree Protection Plan can be referred to in a specifically worded Condition to ensure the trees are appropriately protected during the installation works.

Tim Laddiman
Chartered Arboriculturist
Broad Oak Tree Consultants Ltd.

APPENDIX 1

TREE SURVEY EXPLANATORY SHEET

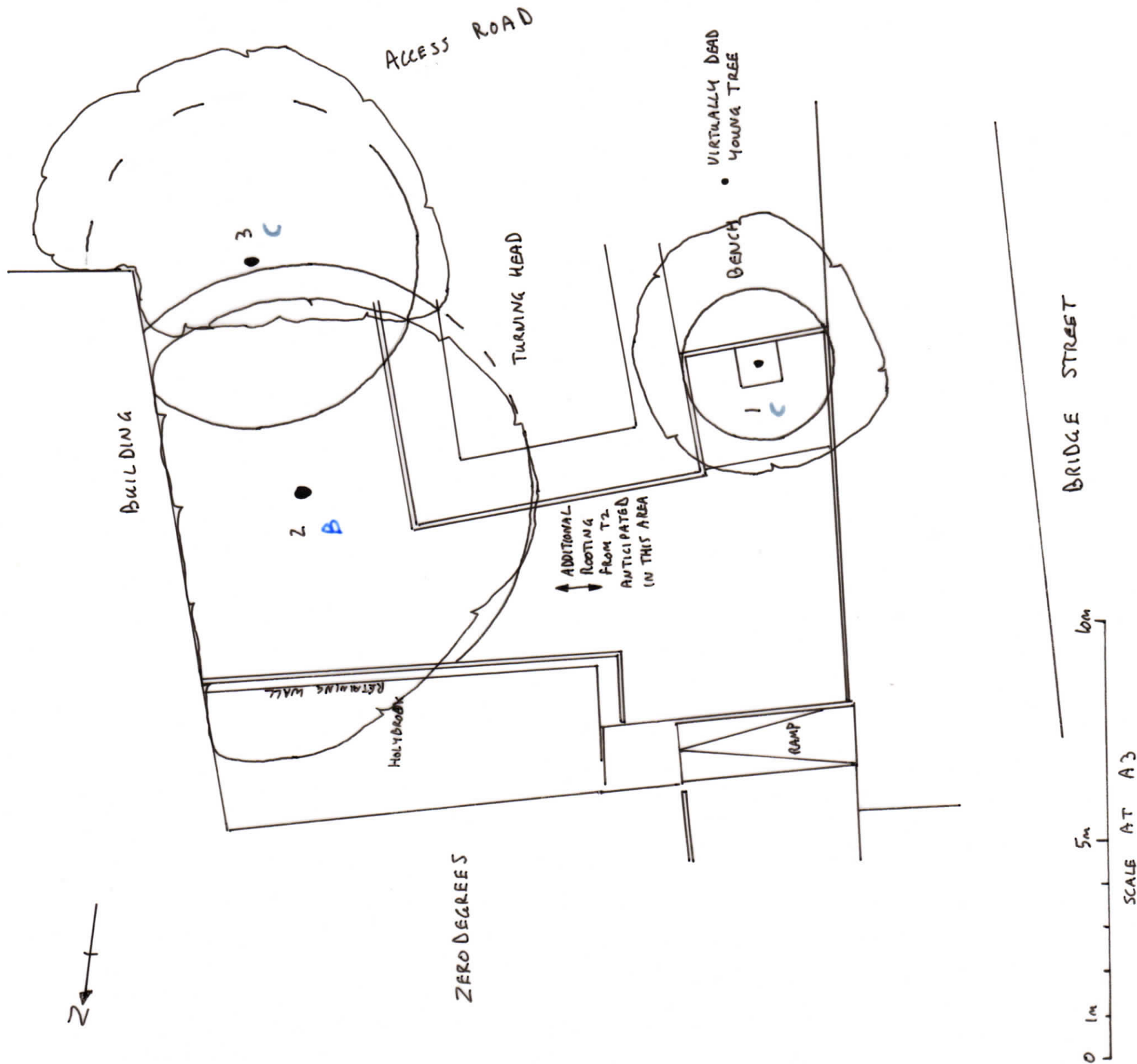
Height	in metres (estimated where ground uneven or access restricted).
Stem count	number of stems
Stem diameter	in mm. at 1.5m. above ground level.
Branch spread	radial spread in metres at four main compass points (estimated where no access).
Age class	Young - Y Middle aged - MA Mature - M Over mature - 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	- 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	Red Oak	7	1	140	2.5	3	3.5	3	Y	1.8+	Fair	20-40	C2	Young tree in brick surround planting pit. Lifting bricks. Main leader lost and upper crown starting to spread.	
2	London Plane	16	1	430	6	3	4.5	5.5	Y	1.1+	Good	40+	B2	Crown to E. Constrained by building. Slight lean to W. Surface roots to E.	
3	Wild Cherry	11	1	320	1.5	5	5	4.5	Y	1.5+	Fair	10-20	C2	Slight lean to S. Girdling root to N. Crown raised in past. Crowded.	

APPENDIX 2



Broad Oak Tree Consultants Limited Laurel House, Burwash Road, Broad Oak, Heathfield, East Sussex, TN21 8SS Tel: 01435 862444	
Site:	Zerodegrees, No. 9 Bridge Street, Reading, RG1 2LR
Title:	TREE CONSTRAINTS PLAN
Key: - Tree Location - Tree Number - Crown spread - BS calculated root protection area	
BS Category of Condition - Green A - most desirable for retention - Blue B - desirable for retention - Grey C - could be retained - Red U - unsuitable for retention	
Scale: 1:200 at A3	Date: 10/08/2017
DRAWING NO.: J54.36/01	

APPENDIX 3

TREE PROTECTION INFORMATION Protective fencing measures to be installed at locations specified prior to commencement of any site works. Protective fencing to comprise scaffold uprights driven into the ground to 60cm depth at no more than 3m spacing. Uprights 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 5" 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. 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 offices/sales buildings, temporary car parking facilities, porta-toos, 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.	
Broad Oak Tree Consultants Limited Laurel House, Burwash Road, Broad Oak, Heathfield, East Sussex, TN21 8SS Tel: 01435 862444	
Site:	Zerodegrees, No. 9 Bridge Street, Reading, RG1 2LR
Title:	TREE PROTECTION PLAN
Key:	● Tree Location 1-3 Tree Number ☁ Paced crown spread ○ BS calculated root protection area BS Category of Condition A - most desirable for retention B - desirable for retention C - could be retained U - unsuitable for retention BS - calculated root protection area ●—● Protective fencing ▨ Ground protection measures Base drawing from Design LSM "Existing & Proposed Ground Floor Terrace Plan", drawing no. 02-06 Rev A
Scale:	1:200 at A3
Date:	10/08/2017
DRAWING NO.: J54.36/02	

