7570

Burleigh Street, Barnsley

– BS 5837 (2012) Tree Survey , Arboricultural Impact Assessment and Arboricultural Method Statement

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March 2016

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Report Title: **Burleigh Street, Barnsley**
BS 5837 (2012) Tree Survey, Arboricultural Impact Assessment and Arboricultural Method Statement

Revision: **V01**
Issue Date: **March 2016**
Report Ref: **7570**

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Executive Summary

On behalf of Park Grove Burleigh Limited, Ecus Ltd. have carried out a tree survey to BS 5837 (2012) "*Trees in relation to design, demolition and construction- Recommendations"* in March 2016 at Burleigh Street, Barnsley. The survey has formed the basis of an assessment of the impact development proposals may have on existing trees and any methodologies to be adopted to protect any retained trees.

The survey records all trees within the site and all those which may be affected by any development proposals within the site boundary, recording a number of parameters including species, crown spread and Root Protection Area (RPA).

Throughout this report 'RPA' is used to refer to 'Root Protection Area'. The RPA of any given tree is the area of ground around that tree which should not be disturbed by excavation, compaction, changes in level or other construction/demolition operations. The extent of the RPA is calculated in accordance with BS5837 (2012), and is an important part of the methodologies described in this report.

The survey recorded nine individual trees which have been planted in a simple landscape setting.

The Client proposes construction of a healthcare development with pharmacy and car park. This will require the removal of two trees, but may also have an impact on above and below ground parts of retained trees unless adequate protection of these trees is provided.

This report details the arboricultural impact and offers a range of protection measures that should be put in place prior to works starting on site as well as construction methodologies which should be adopted. These measures as described in detail in Chapter 5 will prevent accidental damage and other adverse affects on the health of retained trees and cover:

- Protective fencing;

This report also makes further recommendations for any measures to mitigate or compensate the loss of trees within the site and the likely impact on the site and the local landscape. These include:

- Replacement tree planting to compensate the loss of trees.

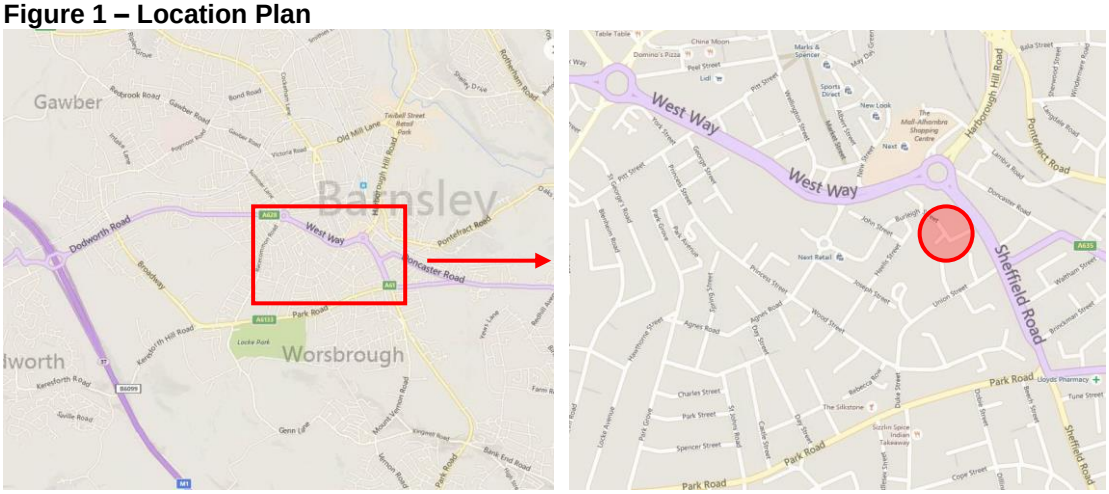
Contents

1. Introduction

1.1.1 Ecus Limited were commissioned by Park Grove Burleigh Limited to undertake a tree survey of the site Burleigh Street, Barnsley. The site location is shown on Figure 1 below.

1.1.2 The survey was carried out in accordance with BS 5837 (2012) "*Trees in relation to design, demolition and construction- Recommendations*". This report sets out the findings of the survey and recommendations have been made for preliminary tree work that may be required.

Figure 1 – Location Plan



2. Tree Survey Methodology

2.1 Site survey

2.1.1 Ecus carried out the tree survey in March 2015 when the trees were not in leaf. The tree survey was a ground based visual inspection carried out by a suitably qualified arboriculturist. The trees were not tagged as part of the survey.

2.1.2 The inspection of the trees, the site and the immediate surrounding area was carried out by Zoe Wareham, MArborA CMLI.

2.1.2 The following characteristics were recorded:

- Species
- Stem diameter at 1.5m above ground level (mm).
- Estimated height (m)
- Approximate crown spread (m) as North, South, East and West measurements.
- An estimate of the number of years that the tree is likely to remain suitable for retention.

  <10 = less than 10 years

  10+ = 10-20 years

  20+ = 20-40 years

  40+ = more than 40 years

- Age class

  YNG = Young and recently established trees

  SM = Semi-mature trees age less than 1/3 life expectancy

  EM = Middle age trees 1/3 – 2/3 life expectancy

  M = Mature trees over 2/3 life expectancy

  OM = Over mature – declining or moribund trees of low vigour

- Condition category in accordance with BS5837: Trees in relation to the design, *demolition and construction recommendations (2012)*. The categories listed are defined as per BS5837:2012 and briefly are:

  U = Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years

  A = Those of high quality and value- best trees with a long expected safe life

  B = Those of moderate quality and value

  C = Those of low quality and value and trees less than 15cm diameter

- Value subcategories in accordance with *BS 5837:2012.* The subcategories listed are defined as per BS5837:2012 and briefly are:

  1 = Mainly arboricultural values

  2 = Mainly landscape values

  3 = Mainly cultural values, including conservation

- General notes about physiological and structural condition and any management recommendations.

2.1.3 The survey recorded all trees on site with a stem diameter of 75mm or more at 1.5m height and includes all trees outside the site boundary which may be affected by any future development of the site, either by their crown overhanging the site or their Root Protection Area potentially extending into the site.

2.1.4 A full topographic survey of the site was provided; this was used as the basis for producing the tree survey plan. .

2.2 Consultation with Local Authority

2.2.1 The survey included identification of any existing designations affecting trees on site such as Tree Preservation Orders and Conservation Area status by consulting with Ed Jowett, Tree Officer Barnsley Metropolitan Borough Council and checking the map information available on Barnsley Metropolitan Borough Council's online interactive map at https://stratus.pbondemand.eu/connect/barnsley/.

2.3 Calculation of Root Protection Area (RPA)

2.3.1 Below ground constraints to development are represented by the root plate around a tree which needs protecting in order for the tree to be incorporated into a proposed scheme, without adverse harm to the tree or structural integrity of any proposed foundation structures. This area is illustrated by the Root Protection Area (RPA) and is calculated according to the formulae set out in BS5837:2012 clause 4.6.1.

2.3.2 Any deviation in the RPA from the original circular plot should take account of physical site conditions that influence the disposition of tree roots, e.g. streams, building foundations and retaining walls.

3. Tree Survey Results

3.1 General Site Description

3.1.1 The site is a small pocket of land situated between urban development, bounded on one side by a rocky wall. Currently, approximately half of it is a car park, and the other half is landscaped as a square grass area enclosed by mixed shrubs.

3.1.2 The trees surveyed during the site visit are located as follows:

- T1 in shrub bed adjacent to the car park
- T2 and T3 in shrub bed enclosing square grass area
- T4-T9 outside the north edge of the site adjacent to neighbouring development.

3.1.3 There is a steep landscaped bank down to Sheffield Road on the north east side of the site, and a steep rocky wall on the south west corner of the site.

3.1.4 Trees T4-T9 are currently seen from public on Sheffield Road, but the other trees can only be seen from the neighbouring developments.

3.2 Results of Tree Survey

3.2.1 The Tree Survey Schedule in Table 1, Appendix 1 describes the results of the tree survey and includes preliminary management recommendations. The table should be read in conjunction with Figure 2 Tree Survey and Tree Constraints Plan. This drawing illustrates the location of the trees surveyed, the extent of their canopies as well as the Root Protection Areas (RPA) of each tree and tree group.

3.2.2 Nine individual trees have been recorded during the survey. A full survey to BS 5837 (2012) was carried out for those trees, including the recording of the stem diameter to determine the Root Protection Area (RPA) of the trees.

3.2.3 Species include sycamore, birch, ornamental oak and alder. The sycamore are young, and the rest are early mature.

3.2.4 The noticeable trees on site are the early mature trees offsite growing adjacent to a neighbouring building (T4-T9 category B – moderate quality). T1 sycamore has good form and potential to grow to a good quality tree in its current location.

3.3 Tree Designations

3.3.1 The Tree Officer at Barnsley Metropolitan Borough Council confirmed that there are no Tree Preservation Orders (TPO) on any of the trees surveyed. The site is not within a Conservation Area.

4. Arboricultural Impact Assessment (AIA)

4.1 Development Proposals

4.1.1 An Arboricultural Impact Assessment of the proposed site plan has been undertaken to assess the likely impact of the development on existing trees and tree groups. This assessment is based on the development plan provided by the Park Grove Burleigh Limited (ref: P+HS architects 2562-D-00-SK21 rev A dated February 2016).

4.1.2 The client proposes a two storey health centre with associated pharmacy and 19 car parking spaces.

4.2 Arboricultural Impact Assessment

Direct impact from development

4.2.1 The development plan indicates that one tree (T2 sycamore) within the red line site boundary will need to be removed to accommodate the new development, including new buildings, new roads and drives as well as new hard landscape.

Spatial constraints

4.2.2 The north east corner of the proposed building is less than 3.5m from T3 birch. Although this is outside the Root Protection Area for this tree, the canopy is already very close to the building line. It is not recommended to manage birch with a regime of canopy reduction as its form can be seen through its very light canopy (small leaves and dainty terminal branch structure). T3 is not considered above low quality in its existing form. Removal of T3 is recommended to minimise restrictions during building construction and any future conflicts between branches and the building or the future requirement to manage the tree(s).

Summary

4.2.3 A total of two Category C trees (T2 and T3) are proposed for removal accommodate the development.

4.3 Recommendations

4.3.1 As the development proposals assume the removal of two trees growing within the site, no protection measures will be required for those trees.

4.3.2 Chapter 5 Arboricultural Method Statement describes measures to protect the retained trees during the development, and operations within the RPA of retained trees including:

- Protective fencing;

4.3.3 It is recommended that replacement tree planting is carried out on the steep bank down to Sheffield Road, and within the planting areas adjacent to Burleigh Street. The trees should be planted at minimum selected standard size. Proposed tree species should be suitable for low maintenance, road side amenity, and narrow canopy or tolerant of potential pollarding management. Recommended tree species include Tilia ‘Green Spire’, Prunus ‘Amanagowa’, Amelanchier lamarckii and Betula spp.

5. Arboricultural Method Statement (AMS)

5.1.1 The Arboricultural Method Statement should be read in conjunction with Figure 3 Tree Protection Plan in Appendix 4. The Arboricultural Method Statement paragraphs below are written in the chronological sequence they are to be carried out:

5.2 Protective Barrier/Tree Protection Fencing

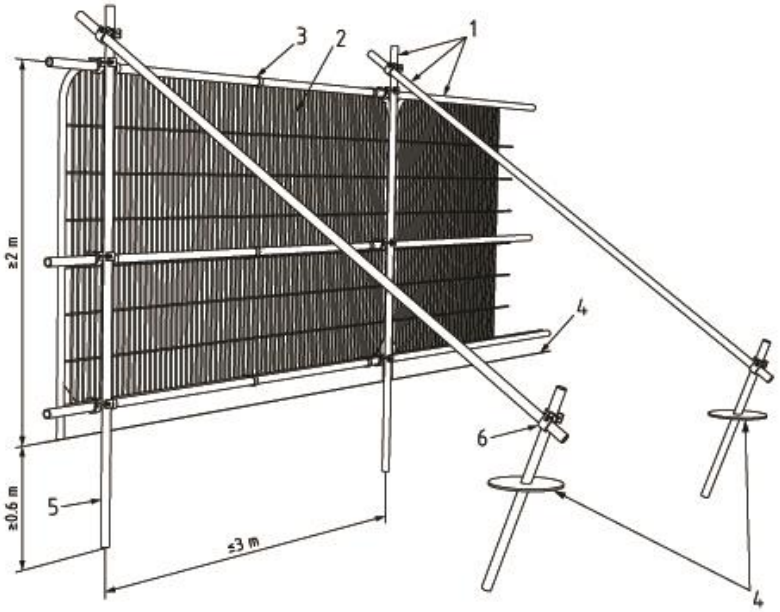
5.2.1 The development design prepared for the site indicates that tree T1 is being retained. In addition there are several trees off site within 12m of the site boundary. All these trees need to be protected from all construction operations by a protective barrier (fencing to BS5837 (2012) which creates a sacrosanct Construction Exclusion Zone (CEZ).

5.2.2 The alignment of the protective barrier is based on the calculated extent of the RPA in accordance with BS5837 (2012). The detailed alignment is shown in Figure 3 Tree Protection Plans in Appendix 4, but for this project the alignment follows the kerb line.

5.2.3 On this scheme, the retained trees are not within the construction area, but are exposed to damage from storage of materials on the root area compacting the soil and passing/reversing vehicles with or without long arms damaging the canopy.

5.2.4 Protective fencing should be erected before any construction/demolition operations start on site and should be removed only on completion of all construction works on site.

Figure 4: Default Specification for Protective Barrier to BS 5837 (2012)



Key
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

5.2.5 The default specification for protective barrier is shown in Figure 4 above. Site hoarding is an acceptable alternative. It may be appropriate on some sites to use temporary site offices as components of the protection barriers, on the understanding

that they will remain in situ for the duration of the construction/demolition works and their removal will be planned to ensure the Contractor's co-ordinated withdrawal from site away from the trees rather than towards them.

5.2.6 BS 5837 (2012) clause 6.2.2.3 specifies an alternative protective barrier where site circumstances and associated risk of damage incursion into the RPA do not necessitate the default level of protection. This can include 2m tall welded mesh panels (e.g. Heras fencing) on rubber or concrete feet to protect from cars, vans, pedestrians and manually operated plant. This is suitable for protection around trees T4-T9. Tree T1 is a small tree where erection of a 2m high protective barrier would damage the canopy, so the protective fence along the back of the footway should be a lower barrier, although the back of the car park kerb can be a 2m high barrier.

5.2.7 All weather notices should be placed on fencing to indicate that operations are not permitted within the fenced area, for example "CONSTRUCTION EXCLUSION ZONE – NO ACCESS" or similar.

5.2.8 Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor.

6. Tree Management

6.1.1 The following section provides some general guidance as to how retained trees could best be protected during construction. More detailed guidelines for tree protection during construction are given in BS5837: Trees in relation to the design, demolition and construction recommendations (2012).

6.1.2 Any tree roots severed during site clearance works should be wrapped or covered with hessian sheets as an immediate protection measure against rapid temperature changes. This should be removed prior to backfilling which should be carried out as soon as possible. In addition the advice of an arboriculturalist, or the Tree Officer of the local planning authority, should be sought as soon as possible on the potential effect of the root damage on the tree's stability, vitality and legal implications.

6.1.3 All tree works should follow best practice procedures as set out in BS 3998 (2010). All trees should be maintained in good condition on site and be inspected annually (where overall condition requires) or every 2 years and after any major storm events, with safety a priority.

6.1.4 The best practice principles have been broadly summarised below:

- Once areas around trees have been protected by fencing, any works on the remaining site area may be commenced providing activities do not impinge on protected areas.
- Wide or tall loads etc. should not come into contact with retained trees. Banksman should supervise transit of vehicles, jibs, booms etc. where this is in close proximity to retained trees.
- Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree bole. No concrete mixing should be done within 10m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.
- No fires will be lit where flames are anticipated to extend to within 5m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire.
- Notice boards, telephone cables or other services should not be attached to any part of a retained tree.
- In the event of having caused any branch or limb damage to retained trees, the advice of an arboriculturalist should be sought on what tree surgery be carried out, in accordance with BS 3998 (2010) Recommendations for Tree Work, to correct the damage, and the best timescale for that tree surgery which will be determined by season, species, gravity of damage and legal status of the tree (Tree Preservation Order/ Conservation Area/nesting birds/roosting bats).

6.1.5 All of the above precautionary measures should be applied to minimise the effect of any damage to long-term tree health and safety.

6.1.6 It is recommended that any trees that require removal or significant canopy works, should be checked in advance of works by an ecologist to ensure there is no possibility of any disturbance to nesting birds or roosting bats.

Appendix 1 – Tables

Table 1 – BS5837 Tree Survey Schedule

Key:	Measurements	Age – Class	Overall Condition	BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category	Symbols:
	MS – Multi-stemmed	YNG – Young Mature	G – Good	A – High	< = less than
	Ht - Height in metres	SM – Semi-mature	F – Fair	B – Moderate	~ = approximately
	Stem – Stem Diameter at 1.5m in mm	EM – Early mature	P – Poor	C – Low	> = greater than
	Crown – Crown spread in metres	M – Mature	D - Dead	U – Unsuitable for retention	
	TD - Trunk division (height in metres)	OM – Over mature		**Sub-categories:**	
		Est Yrs – estimate of years remaining (40+ years; 20+ years; 10+ years, <10 years)		**1** = mainly arboricultural values **2** = mainly landscape values **3** = mainly cultural values.	
RPA = Root protection area (equivalent to a circle with a radius 12 x the stem diameter of single stem trees or 12 x the notional stem diameter of multi stemmed trees as per BS 5837:2012 clause 4.6). This will be capped to 707m² for trees with a stem diameter larger than 1.25m.					

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (mm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations	BS 5837 Category	RPA Radius (m)	RPA (m²)
T1	Sycamore *(Acer pseudoplatanus)*	4	15, 10	3	3	2	3	1	SM	40+	Good	-	None at present.	C2	0.22	0.15
T2	Sycamore *(Acer pseudoplatanus)*	6	10 x 4, 15 x 2	3	4	3	4	0.5	SM	40+	Fair	-	None at present.	C2	0.35	0.38
T3	Silver birch *(Betula pendula)*	7	15	2	2	3	2	0.35	EM	20+	Fair	-	None at present.	C2	0.18	0.10
T4	Silver birch *(Betula pendula)*	10	25	2	2	4	5	4	EM	20+	Good	-	None at present.	B2	0.30	0.28
T5	Scarlet Oak *(Quercus coccinea)*	10	25	3	4	2	3	4	EM	40+	Good	-	None at present.	B2	0.30	0.28
T6	Scarlet Oak *(Quercus coccinea)*	10	22	2	4	4	3	3	EM	40+	Good	-	None at present.	B2	0.26	0.22
T7	Silver birch *(Betula pendula)*	11	22	2	4	3	1	4	EM	20+	Fair	-	None at present.	B2	0.26	0.22

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (mm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations	BS 5837 Category	RPA Radius (m)	RPA (m^2)
T8	Silver birch *(Betula pendula)*	11	15	0	3	2	0	4	EM	20+	Poor	-	None at present.	C2	0.18	0.10
T9	*Alder (Alnus sp.)*	9	18	2	3	2	2	0.5	EM	40+	Good	-	None at present.	B2	0.22	0.15

7. Appendix 2 – Site Photographs

T2 Sycamore
Proposed for removal

T4 – T9
Off-site trees growing adjacent to neighbouring building

8. Appendix 3 – Tree Survey and Tree Constraints Plan

T1
T2
T3
T4
T5
T6
T7
T8
T9
SHEFFIELD ROAD
BURLEIGH STREET
Existing Car Park
28no. spaces
N

KEY- Tree Survey and Tree Constraints Plan
(to be read in conjunction with Ecus Ltd. Tree Survey report ref. L7570 Burleigh Street, Barnsley)

Tree surveyed by Ecus - location of tree centre from topographic survey

Tree surveyed by Ecus - tree location approximated by Ecus

Tree categories (BS 5837:2012)

Category A Trees

Category B Trees

Category C Trees

Category U Trees

Root Protection Area (RPA) of category A, B and C trees and category U trees if protected by Tree Preservation Order

Rev	Date	Initials	Checked	Revision notes
A	09.03.16	ZW	ECUS	DRAFT

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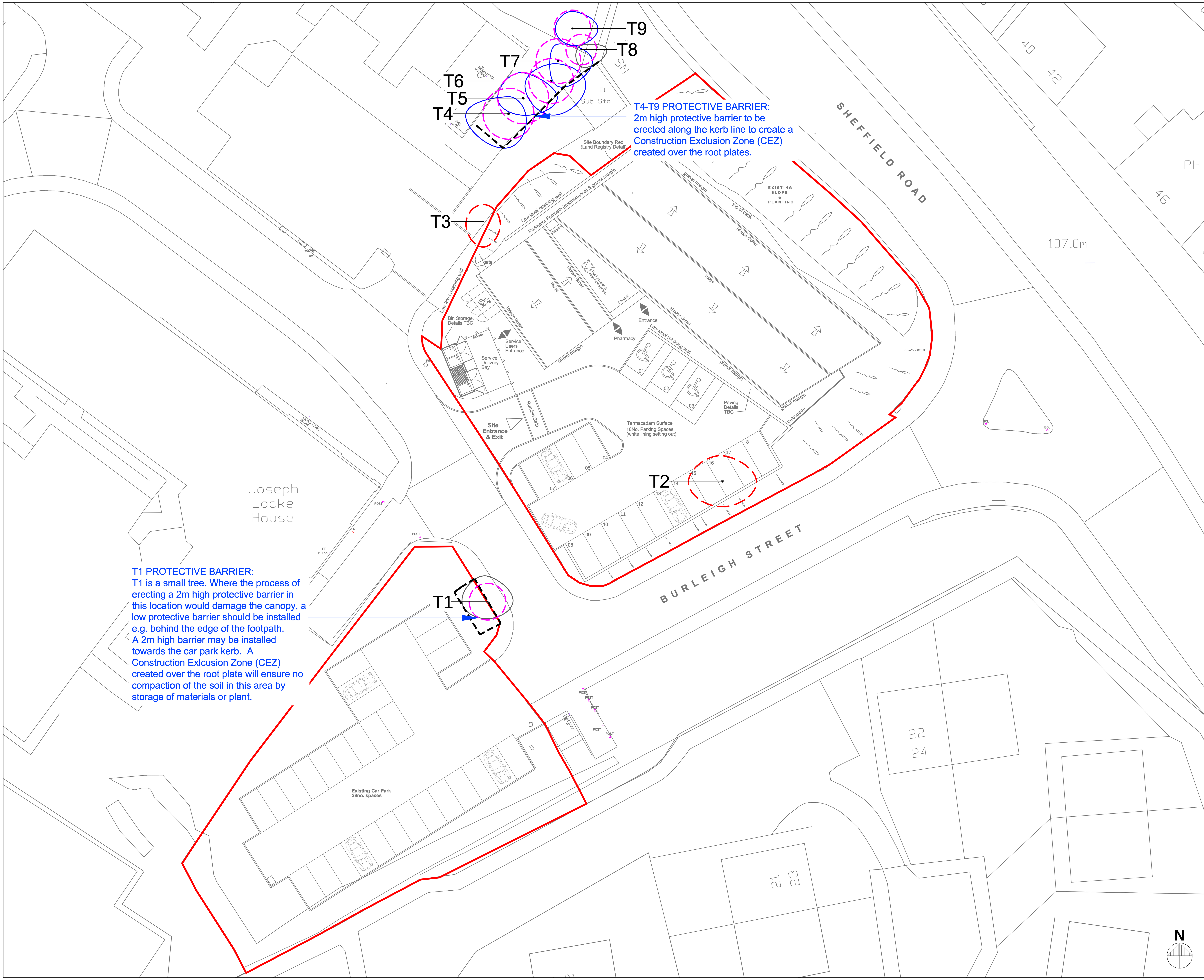
BURLEIGH STREET, BARNSLEY

Title
Figure 2
Tree Survey and Tree Constraints Plan

Drawn by	Date	Scale @ A1	Drg. no.
ZW	Mar 2016	1:200	L7570/01

9. Appendix 4 - Tree Protection Plan


T9
T8
T7
T6
T5
T4
T3
T2
T1
El Sub Sta
T4-T9 PROTECTIVE BARRIER:
2m high protective barrier to be erected along the kerb line to create a Construction Exclusion Zone (CEZ) created over the root plates.
Site Boundary Red (Land Registry Detail)
SHEFFIELD ROAD
EXISTING SLOPE & PLANTING
107.0m
PH
40
42
46
Joseph Locke House
Low level retaining wall
Perimeter Footpath (maintenance) & gravel margin
Bin Storage Details TBC
Bike Store
Service Users Entrance
Service Delivery Bay
Entrance
Pharmacy
Paving Details TBC
balustrade
Site Entrance & Exit
Rumble Strip
Tarmacadam Surface 18No. Parking Spaces (white lining setting out)
BURLEIGH STREET
T1 PROTECTIVE BARRIER:
T1 is a small tree. Where the process of erecting a 2m high protective barrier in this location would damage the canopy, a low protective barrier should be installed e.g. behind the edge of the footpath.
A 2m high barrier may be installed towards the car park kerb. A Construction Exlcusion Zone (CEZ) created over the root plate will ensure no compaction of the soil in this area by storage of materials or plant.
Existing Car Park 28no. spaces
22
24
21
23
N

KEY- Tree Protection Plan
(to be read in conjunction with Ecus Ltd. Tree Survey report ref. 7570)

- Tree surveyed by Ecus - location of tree centre from topographic survey
- Tree surveyed by Ecus - tree location approximated by Ecus

Tree categories (BS 5837:2012)

- Category A Trees
- Category B Trees
- Category C Trees
- Category U Trees
- Existing tree to remove
- Root Protection Area (RPA) of trees to be retained
- Protective Barrier - BS5837 (2012), clause 6.2.2

Rev	Date	Initials	Checked	Revision notes
A	09.03.16	ZW	ECUS	Preliminary

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Title
Figure 3
Tree Protection Plan

Drawn by	Date	Scale @ A1	Drg. no.
ZW	Mar 2016	1:200	L7570/02