Brown Edge Road

Buxton

– BS 5837 Tree Survey

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Report Title: **Brown Edge Road, Buxton**
Tree Survey Report

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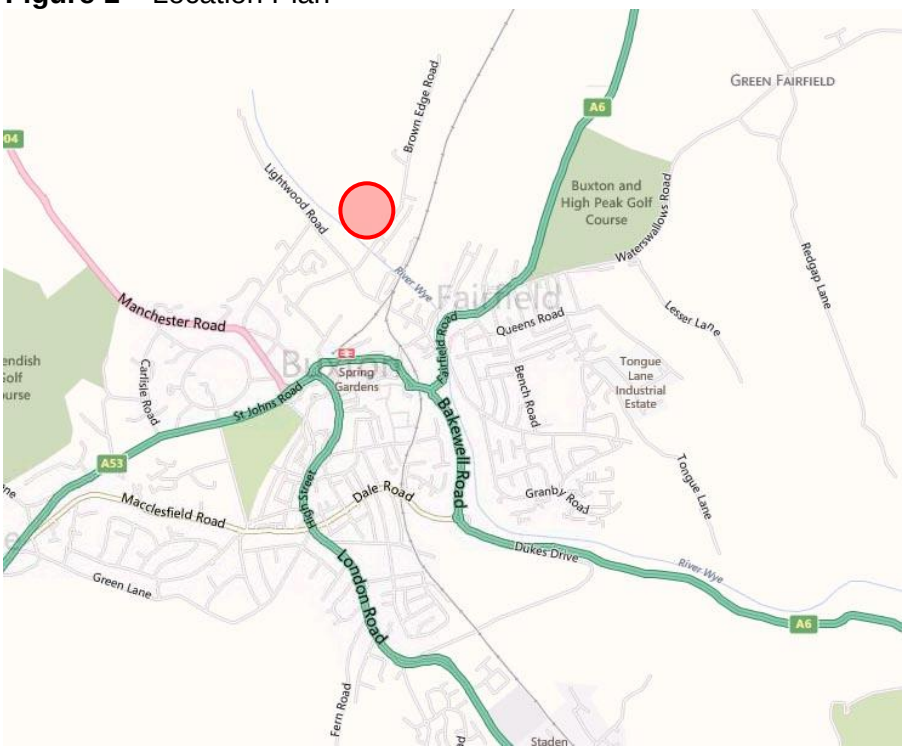
1. Introduction

1.1.1 Ecus Limited were commissioned by Keepmoat to update an existing Tree Survey of the Brown Edge Road site in Buxton, Derbyshire. The site location is shown on Figure 1 below.

1.1.2 The existing tree survey was carried out by Sylvanus Arboricultural Consultants in January 2010. An updated survey is required to record any changes of the tree inventory and to include any additional information required by the revised BS 5837 published in 2012. It also includes a full Tree Survey Plan, Tree Constraints Plan and Tree Protection Plan.

1.1.3 The updated 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. Methodology

2.1 Tree Survey

2.1.1 Ecus carried out the tree survey in June 2013 when the trees were in leaf. The tree survey was a ground based visual inspection carried out by an arboriculturist. The trees were not tagged as part of the survey.

2.1.2 The following characteristics were recorded:

- Species
- Stem diameter at 1.5m above ground level (mm).
- Estimated height (m)
- Approximate crown diameter (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 trees age less than 1/3 life expectancy

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

2.1.4 The survey also included identification of any existing designations affecting trees on site such as Tree Preservation Orders and Conservation Area status by consulting with High Peak Borough Council officers.

2.2 Root Protection Area (RPA)

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.

3. Survey Results

3.1 General Site Description

3.1.1 The plot comprises semi-improved grassland with components that are indicative of damp conditions. Tree groups are present along the perimeters of the site and a single storey building is present along the northern boundary.

3.1.2 The roadside boundary is a stone wall, retaining the road in the south east corner of the site where there is a 0.5m level difference. There is also a level difference between the informal path that runs along the north boundary, with its verge sloping down to the site, overcoming a level difference of approximately 1m.

3.1.3 A chainlink fence encloses the site to the west and south. It is in poor condition and separates the site from a woodland and pond which are located immediately to the south of the site.

3.2 Results of Tree Survey

3.2.1 Table 1 describes the results of the tree survey and includes preliminary management recommendations. The table should be read in conjunction with Figure 3 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 The 2010 survey recorded two individual trees and eight tree groups within the site.

3.2.3 In June, tree groups G1- G4, G6 and G8 were resurveyed. The trees within G5 were re-surveyed as individual trees (T14-T18). Group G7 was split into two separate groups due to the trees forming two distinctive smaller groups (G7A and G7B). The survey also picked up five additional trees which are located just outside the north east boundary and two trees outside the south boundary (T19 and T20). The Sylvanus tree references T2 and T1 were resurveyed as T21 and T22.

3.2.4 The trees surveyed were predominantly native species and include ash *(Fraxinus excelsior)*, lime *(Tilia cordata and T. platyphyllos),* goat willow *(Salix caprea),* alder *(Alnus glutinosa)*, beech *(Fagus sylvatica)*, rowan *(Sorbus aucuparia)* and whitebeam *(Sorbus aria)*. Other species include Norway maple *(Acer platanoides)* and sycamore *(Acer pseudoplatanus)*. Two coniferous species were noted: Yew *(Taxus baccata)* and Scots Pine *(Pinus sylvestris)*.

3.2.5 A significant number of trees surveyed are mature specimens forming the boundary along Brown Edge Road and the playing fields to the north. The trees along the south boundary form the transition to the woodland to the south of the site.

3.2.6 Most trees surveyed are category B (moderate quality and value) and category C (low quality and value) trees. One tree, T17, near the south west boundary is of poor quality and is therefore of category U.

3.3 Tree Designations

3.3.1 The Tree Officer at High Peak Borough confirmed that there are no Tree Preservation Orders on any of the trees surveyed. The site is not within a Conservation Area.

4. Arboricultural Impact Assessment and Method Statement

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 Client (ref: Glancy Nicholls Architects ref. 13006-A100 revision F dated April 2013).

4.1.2 The client proposes the development of extra care housing with associated car parking and hard and soft landscaping.

4.1.3 The development plan indicates that all trees along the south boundary and the Brown Edge Road frontage as well as both groups G7A and G7B will be retained. Along the north boundary, two trees within G6 and all trees within G8 will require removal do facilitate the construction of the building and level changes along the footpath to the playing field.

4.2 *Recommendations*

4.2.1 As the development proposals assume the removal of G8 and two trees within G6, no protection measures will be required for these trees.

4.2.2 It is recommended that replacement tree planting is carried out within the proposed landscape scheme for the site. Proposed tree species should be suitable for small garden spaces, and planted at minimum Heavy Standard size.

4.2.3 All trees to be retained require protective fencing in accordance with BS 5837:2012.

4.2.4 Additional protective measures will be required where construction access and construction work is justified in the Root Protection Areas of trees to be retained. These measures include no-dig construction for proposed permanent paving and access facilitation pruning where low hanging branches may be liable to damage during construction operations.

4.3 *Arboricultural Method Statement (AMS)*

4.3.1 Protective Barrier

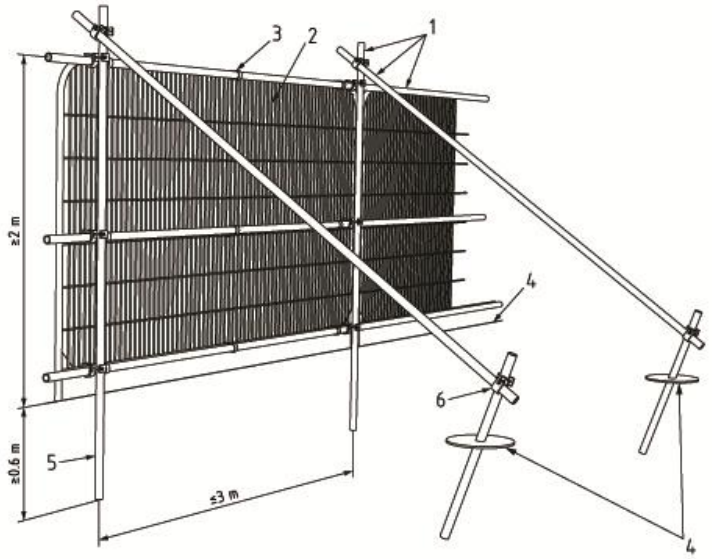
The development design prepared for the site indicates that the trees being retained require protective fencing during the development works to BS 5837 (2012).

4.3.2 Protective fencing should be erected before any work commences on site. Protective fencing should be removed only on completion of all construction work. The protective fencing should be specified in accordance with the Default Specification for Protective Barrier to BS 5837 (2012) as shown in Figure 2 below.

4.3.3 The protective barrier will need to be set out to protect the full RPA and canopy spread of trees to be retained. The fencing needs to be in place during all construction work for the care home and hard landscaping outside the RPA. The fencing needs to be set back to facilitate the construction of garden paths and car parking spaces within the RPA of retained trees, and moved back to its original main alignment on completion of these works. Both alignments are shown in Figure 4.

4.3.4 Trees for removal do not need protection. The individual trees to be removed should be identified and marked by an arboricultural consultant.

Figure 2: 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

No-dig construction

4.3.5 For the proposed footpaths and car parking spaces a no-dig approach should be adopted to avoid any damage of tree roots.

4.3.6 A geotextile will be laid out on top of the ground surface, before a three-dimensional Cellular Confinement System (CCS) will be installed as an integral component of the sub-base of the footpath. Infill materials should include no-fines aggregate (granular) sub-base layer which when compacted is free draining and allow gaseous exchange. Clean angular stone 4-20mm or 20-40mm in diameter, or angular gravel over 4mm are able to create a positive interlock with the CCS.

4.3.7 The wearing course should be a permeable surface allowing gaseous exchange and the infiltration of water into the root zone.

4.3.8 Kerbs and edgings that require excavations should not be used. Where kerbing is required, peg and board edging should be installed.

Fence construction and installation of street and garden furniture within RPAs

4.3.9 Where fence posts need to be installed within RPAs, excavations should be minimal and carried out using hand held tools. Fence posts should be erected at least 1m from trees, using metal post support spikes within the RPA. Excavations should also be kept to a minimum where garden and street furniture is to be installed using concrete foundations.

Installation of power supply and services

4.3.10 Underground power supply and services routed through the RPA should be installed using trenchless solutions in accordance with BS 5837:2012 clause 7.7.2. and NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.

Access facilitation and management pruning (G1-G4, G6, T19)

4.3.11 Where low canopies prevent the erection of the protective barrier or where they may be damaged during construction work, the canopies should be raised to 3m above ground level. Careful crown lifting may also be used to create a 2.5m clear height above garden paths and patios.

4.3.12 Tree T19 requires pruning to remove the heavy limb overhanging the site which may pose a safety hazard to the users of the site.

5. Tree Management

5.1.1 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).

5.1.2 Any development proposals should seek to safeguard category B trees and trees growing offsite as well as their root protection areas (RPA). In addition refer to specific management recommendations in Appendix 1 for any other trees to be retained.

5.1.3 Any trees being retained during a proposed development will need to be adequately protected during any approved development works. As a general rule at this site, measures to protect trees should follow the best practice principles set out in BS5837: Trees in Relation to design, demolition and construction – recommendations (2012).

5.1.4 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.

5.1.5 Table 1 lists any preliminary management recommendations for each tree which include monitoring or maintenance works necessary to maintain the tree's health and structural integrity and ensure the safety of people using the site and the public, irrespective of any development proposals.

5.1.6 Prior to any construction or development work proceeding, the RPA's of individual trees to be retained should be marked out using the distances provided in the table within Appendix 1. Marking out should be completed by a person with arboricultural or horticultural expertise as individual trees will have root zones that may be affected by local conditions and allowances will need to be made to accommodate this. The best practice principles have been broadly summarised below:

- All trees retained adjacent to the site should be protected by barriers or ground protection around the calculated Root Protection Area (RPA) and as indicated on any Tree Protection Plan (TPP) that may be produced in association with the assessment.

- Any fencing required should be erected prior to commencement of construction and before demolition including erection of any temporary structures. Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor.

- Arrangements should be made for an arboriculturist to supervise works and tree protection where trees are particularly vulnerable or sited close to access points.

- Pre-development works may be undertaken prior to the installation of fencing with the agreement of the local planning authority.

- 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.

- Fencing should be clearly visible and suitable for the location, type and

proximity of construction activity.

- It may be appropriate on some sites to use temporary site offices as components of the protection barriers.

- Where it has been agreed and shown on a Tree Protection Plan, construction access may take place within the RPA if suitable ground protection measures are in place (e.g. existing surfaced car park areas). In other areas this may comprise single scaffold boards over a compressible layer laid onto geo-textile materials for pedestrian movements. Vehicular movements over the RPA will require the calculation of expected loading and may require the use of proprietary protection systems.

- 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. Notices should be placed on fencing to indicate that operations are not permitted within the fenced area.

- 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.

- Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment, as part of construction works, and such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs, of retained trees within the RPA fencing, it is best advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obvious problem branches. This is classed as ‘Facilitation Pruning’ within BS 5837 (2012). Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturalist.

- It is advised that a Pre-Commencement Site Meeting is held with contractors who are responsible for operating machinery, as described above. To firstly highlight the potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact.

- In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with BS 3998 (2010) Recommendations for Tree Work, to correct the damage, upon completion of development.

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

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. None of the trees assessed have significant potential for roosting bats.

6. Appendix 1 – Tables and Figures

Table 1 - Tree Survey Schedule

Appendix 1: BS5837 Tree Schedule

Key:	Measurements	Age – Class	Overall Condition	BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category	Symbols:
	MS – Multi-stemmed	YNG-MAT-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	Mat – Mature	P – Poor	C – Low	> = greater than
	Crown – Crown spread in metres	OM – Over mature	D - Dead	U – Unsuitable for retention	
	TD - Trunk division (height in metres)	**Est Yrs –** estimate of years remaining (>40 years; >20 years; >10 years, 0-10 years)		**Sub-categories:** **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).

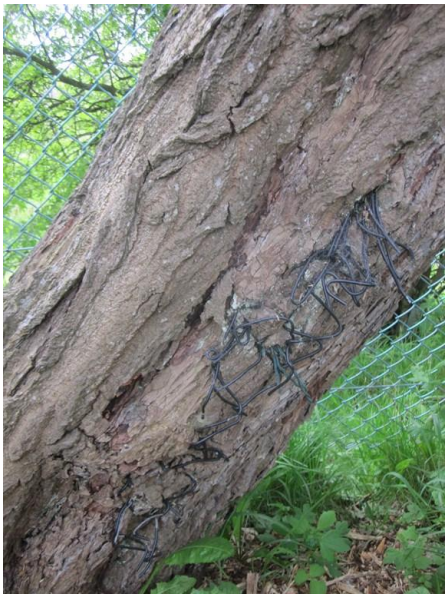
Tree No	Species	Ht (m)	Stem Diam cm@ 1.5m (mm)	Canopy Spread (m) N- E- S- W	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Management Recommendations	BS 5837 Category	RPA Radius (m)	RPA (m²)
G1	Mixed group	6	250	3-3-3-3	0	SM	40+	Good	Group of 3no. Rowan and 1no. Alder	-	B2	3.00	28.27
G2	Mixed group	8	260	2-2-2-2	2	SM	40+	Good	Group of 3no. Alder and 1no. Beech	-	B2	3.12	30.58
G3	Mixed group	5	200	3-3-3-3	0	M	40+	Good	Group of 1no. Beech, 1no. Sycamore, 1no. Norway Maple	-	B2	2.40	18.10
G4	Mixed group	5	180	2-2-2-2	0	SM	40+	Good	Group of 1no. Rowan, 1no. Whitebeam	-	C2	2.16	14.66
G6	Mixed group	15	470	4-4-4-4	2	OM	20+	Fair	Group of overmature Goat Willows with cavities and leaning , one tree with severe chain link fence girdling damage	Monitor, retain if possible for ecological value, remove tree with girdling damage for safety	B2	5.64	99.93

Tree No	Species	Ht (m)	Stem Diam cm@ 1.5m (mm)	Canopy Spread (m) N- E- S- W	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Management Recommendations	BS 5837 Category	RPA Radius (m)	RPA (m^2)
G7A*	Mixed group	12	270	4-4-4-4	1.5	M	40+	Fair	Group of Goat Willow and Norway Maple. One Willow dying and leaning to north	If possible, retain willow for ecological value	B2	3.24	32.98
G7B*	Acer platanoides	12	270	4-4-4-4	1.5	M	40+	Fair	-	-	B2	3.24	32.98
G8	Mixed group	7	180	3-3-3-3	1.8	SM	40+	Good	-	-	C2	2.16	14.66
T9*	Tilia cordata	5	495	2-1.5-2-3	0	M	40+	Poor	Pollarded at 4m, with dense new shoots, twin stem	Re pollard annuaally just above previous pollard point	C2	5.94	110.85
T10*	Taxus baccata	4	200	2-2-2-2	0	M	40+	Good	-	-	C2	2.40	18.10
T11*	Tilia cordata	5	400	2-2-2-2	0	M	40+	Poor	Pollarded at 4m, with dense new shoots, rubbing branches	Re pollard annuaally just above previous pollard point, remove rubbing branches	C2	4.80	72.38
T12*	Carpinus betulus	5	300	2-2-2-2	0	M	40+	Fair	Pollarded at 4m, with dense new shoots	Re pollard annuaally just above previous pollard point	C2	3.60	40.72
T13*	Tilia platyphyllos	12	500	6-5-4-5	0	M	40+	Good	-	-	B2	6.00	113.10
T14*	Fraxinus excelsior	18	340	4-4-4-4	1.5	M	40+	Fair	-	-	C2	4.08	52.30
T15*	Fraxinus excelsior	18	340	4-4-4-4	1.5	M	40+	Fair	-	-	C2	4.08	52.30
T16*	Fraxinus excelsior	18	340	4-4-4-4	1.5	M	40+	Fair	-	-	C2	4.08	52.30

Tree No	Species	Ht (m)	Stem Diam cm@ 1.5m (mm)	Canopy Spread (m) N- E- S- W	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Management Recommendations	BS 5837 Category	RPA Radius (m)	RPA (m^2)
T17*	Betula nigra	10	250	2-2-2-2	1.5	M	40+	Fair	Strong lean to north	Remove	U	3.00	28.27
T18*	Salix caprea	18	340	4-4-4-4	1.5	M	40+	Fair	-	-	C2	4.08	52.30
T19*	Fraxinus excelsior	15	515	10-8-2-3	2.5	M	40+	Fair	Offsite tree leaning over chainlink fence	Remove limb leaning over site boundary	C2	6.18	119.98
T20*	Pinus sylvestris	18	340	3-3-3-3	3	M	40+	Good	-	-	C2	4.08	52.30
T21*	Fraxinus excelsior	6	200	2-2-2-2	2	SM	40+	Good	Offsite tree	-	C2	2.40	18.10
T22*	Fraxinus excelsior	7	170	2-2-2-2	1.5	SM	40+	Good	Offsite tree	-	C2	2.04	13.07
Tree numbering as Sylvanus Arboricultural Consultants' Arboricultural Survey Report dated January 2010. Trees and tree groups highlighted with a * are additional trees surveyed in June 2013, including any tree groups that have been re numbered for practical reasons.													

7. Appendix 2 - Site Photographs

Tree group G8 (left) and footpath to playing field



Girdling damage of goat willow in G6

Group G6 and G7

Trees T14- T18