Arboricultural Impact Assessment

- in accordance with BS5837: 2012

The Croft

Manchester Road

Thurlstone

South Yorkshire S36

3rd March 2023

Reference: **JC/369/230303**

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Summary of report

This report assesses the arboricultural impact of proposed building works at The Croft, in Thurlstone. It was prepared following the guidelines in BS5837: 2012 '*Trees in relation to design, demolition and construction: Recommendations*'.

The proposed development has been planned to fit around the surveyed tree constraints. No tree removals are required. Up to three trees may require pruning of minor low branches to improve clearance for construction access.

Root Protection Areas are to be entirely avoided by design.

The construction works and materials' storage can practically be undertaken without any need to access any currently unsurfaced parts of tree Root Protection Areas (RPAs).

All rainwater and foul drainage and electric and other services are to connect to the existing infrastructure outside of all tree RPAs, with all new excavation for these being outside of all RPAs.

Canopy overhang of the building is minimal and height clearance is sufficient.

Gutter design will be selected so as to avoid leaf blockages.

The appendices to the report include a drawing on which the tree protection requirements are clearly shown, along with various arboricultural methodology requirements.

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1. Introduction

1.1 Terms of instruction and scope of report

Jon Coe Tree Consultancy Ltd was instructed by Kayleigh Costello to survey trees in relation to proposed building works at The Croft, Thurlstone, and to advise on the arboricultural impacts arising from the proposed works. This work was carried out following the guidelines in BS5837: 2012 '*Trees in relation to design, demolition and construction: Recommendations*' (referred to herein as BS5837: 2012[1]).

1.2 Documents supplied by client

Various plans were supplied by Design Space Architecture.

1.3 Items included within this report

The main report describes, in this order: the collection of data; summary of data; arboricultural impact; tree protection and method statement requirements, and other relevant issues. It is followed by photographs, references and appendices.

Central to the purpose of this report are several of the appendices. These are the tree schedules (Appendices A and B) and the drawings at Appendices H (*Arboricultural Impact*) and I (*Tree Protection Plan with Arboricultural Methodology requirements*).

1.4 Qualifications and experience

Principal Consultant Jon Coe holds a BSc (Honours) degree in Arboriculture, Professional-grade membership of the Arboricultural Association, and Associate membership of the Institute of Chartered Foresters. He has worked in arboriculture for 18 years continuously and is committed to continued professional development:

https://joncoetreeconsultancy.co.uk/

1.5 Limitations

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The survey was solely concerned with the requirements of BS5837: 2012[1]. It was not a risk assessment survey, and it considered tree health only so far as necessary to fulfil the requirements of BS5837: 2012[1].

The survey and all observations were made from ground level only.

Observations were valid at the time they were made. However, trees are dynamic and growing structures that experience changes affected by time, weather and other factors.

2. Data collection

2.1 Site visit

The survey was conducted on 8th September 2022, which was a dry day without significant breeze.

2.2 The site and tree layout

Site and tree layout are as shown on the Tree Constraints Plan at Appendix F. Individual trees' details are recorded in the Tree Schedule (Appendix A) and the Tree Constraints data (Appendix B). Findings are summarised in section 3.1.

2.3 Survey method

The initial tree survey was conducted without influence by the development proposal.

Each tree was given a tree identification number, as shown on the Tree Constraints Plan (Appendix F).

Tree positions were as shown on the topographical survey which was supplied to us. For trees not on the topographical survey, positions were

established by measurements from adjacent known tree positions, using a Leica Disto laser rangefinder.

The species of each tree was recorded. Common names are used in the Tree Schedule (Appendix A), with a list of botanical names supplied in Appendix C.

Where appropriate, trees were assigned to group locations if they formed cohesive arboricultural units.

Tree height was estimated in metres (m), to the nearest 0.5 m (rounded up) - or the nearest metre for trees above 10 m.

Stem diameter was measured in millimetres (mm) using a diameter tape, in accordance with the conventions detailed in Annex C of BS5837: 2012[1], which in most cases is at 1.5m above ground level.

Crown spread was recorded at the four cardinal points, to the nearest 0.5m (rounded up) - using a laser range-finder (Leica Disto D810).

Height of canopy clearance was recorded to the nearest 0.5 m. This was necessarily an estimate, as canopy clearance is not usually consistent around the whole tree; a figure for the typical low point around the canopy was therefore estimated. Where appropriate, minor or epicormic branch growth was disregarded, in order to better portray the situation so far as clearance was concerned. Where canopy cover extends both on and off site (i.e. boundary trees), the on-site value for canopy clearance was used unless otherwise stated.

Age class was assessed according to the five possible categories listed in BS5837: 2012[1]. These are young, semi-mature, early-mature, mature and over-mature.

Structural and physiological condition of trees were separately assessed and summarised using five possible categories: poor, moderate, fair, good, very good. More specific observations on condition were noted under ‘Observations’.

‘Observations’ included details of specific structural and physiological issues, notes on past and suggested future management, and problems currently presented by the trees.

An estimate was made (in years) of the potential remaining contribution that each tree could offer, in its current situation, without a need for significant tree surgery operations.

Each tree was categorised according to the guidance given in BS5837: 2012[1] (Appendix D). Retention categories of A, B, C or U were allocated (in descending order of tree quality), with an additional sub-category of 1, 2 or 3 that defines whether the principal category was allocated for arboricultural, landscape or cultural reasons respectively.

Trees were viewed from ground level only.

3. Summary of data

3.1 Trees

This is a planted woodland, with the trees subject to a Tree Preservation Order. The principal canopy species by far is sycamore. There are also small numbers of ash, beech and lime. Holly, box, elm and elder are all present in the understorey.

The canopy trees have been planted densely and have seemingly not been thinned at the appropriate intervals, such that this is to a certain extent an overly dense woodland. For many of the trees, ivy obscures their stem bases. In most cases it is limited to the lower stem.

For the trees relevant to the planning application, details and observations are recorded in the Tree Schedule (Appendix A) and the Tree Constraints Data (Appendix B). Tree locations and their root and crown extents are shown on the Tree Constraints Plan at Appendix F.

Given the significant gradient to the site, canopy clearance is assessed relative to each particular tree’s stem base.

3.2 Retention categories

For the purpose of assessing development constraints, the relevant trees here are assessed individually and in accordance with the criteria in BS5837: 2012[1] (Appendix D). The trees are in many cases very similar, and the

BS5837 categories are a fairly blunt tool for their assessment. Collectively this can be categorised as a Category B2 early-mature woodland. Woodland vitality is good, though vertical structure is somewhat lacking.

From the Tree Schedule at Appendix A it can be seen that nearly half of the surveyed trees are individually good examples of their species, at retention category B, though a few of these are at the lower end of that category (B-). The remainder of the surveyed trees are unremarkable category C trees. None of the surveyed trees are in the highest category A, nor were there any category U trees in the survey area.

3.3 Below ground constraints

The Root Protection Areas (RPAs) are the areas in which construction and activities related to the construction process should in general be avoided, in order to protect the trees' root systems.

Where the specifics of tree and site permit it is sometimes possible to incorporate design measures that prevent the damage that would otherwise occur to the tree's health and stability through soil compaction, level changes, root severance and contamination. Sections 6 and 7 of BS5837: 2012[1] outline methods for protecting RPAs during the construction process, and for building within them under selected circumstances. RPAs are generically calculated as an area equivalent to a circle with a radius 12 times the stem diameter, in accordance with section BS5837: 2012[1]; this also provides methods for calculating the RPA values for of multi-stem trees.

In accordance with BS5837: 2012[1], the RPAs listed in the Tree Constraints data (Appendix B) have been determined from the stem diameter by using Table 4 (Appendix E), whose values are themselves extracted from Table D.1 in Annex D of the standard (BS5837: 2012[1]). Stem diameters are rounded up to align with those in Table 4; potentially to the trees' benefit.

3.4 Above ground constraints

Crown spread details are listed in the Tree Constraints Data at Appendix A. The Appendix B Tree Schedule includes canopy clearance data.

4. Arboricultural Impact Assessment

4.1 The impact of proposed development on trees on this site

The proposed development has been planned to fit around the surveyed tree constraints. Root Protection Areas are to be entirely avoided by design. No tree removals are required. Up to three trees may require pruning of minor low branches to improve clearance for construction access.

The construction works and materials' storage can practically be undertaken without any need to access any currently unsurfaced parts of tree Root Protection Areas (RPAs).

All rainwater and foul drainage and electric and other services are to connect to the existing infrastructure outside of all tree RPAs, with all new excavation for these being outside of all tree RPAs.

Canopy overhang of the building is minimal and height clearance is sufficient. Gutter design will be selected so as to avoid leaf blockages.

5. Tree Protection Plan

5.1 Timing, purpose and importance of tree protection measures

All of the tree protection fencing shown on the drawing at Appendix I must be correctly installed prior to the commencement of any construction work or the delivery of any construction materials or machinery to site.

The primary purpose of the Tree Protection Plan is to prevent the serious and often irreversible harm that can be caused to trees through the compaction of their rooting soil. Compacted soil prevents root function, which causes tree decline or death. This decline is often gradual over a period of time, such that it is often not observed by the offending party. Harmful soil compaction can be caused by vehicles, machinery, footfall, or the weight of stored materials. Chemical spillages, bonfires, level raises and excavation are also all activities that can seriously harm tree roots. The abundant small and fine minor roots are of great importance to trees - these and the roots in general are found much closer to the soil surface than is often assumed. **Trees at this site are legally protected by Tree Preservation Order with protection including their roots as well as their above-ground parts.**

5.2 Tree Protection fencing (temporary) – specification

The protective fencing must be erected exactly where shown on the drawing at Appendix I, and according exactly to the dimensions shown on that drawing. This fencing must be in place prior to any works or deliveries of any materials/machinery to the site area. The fencing will be temporary - in place until all works are complete. Its purpose is to prevent compaction or other damage to the rooting areas of trees.

For this site, the drawing at Appendix I shows two different specifications of tree protection fencing for different parts of the site. These are standard weight and lightweight variations – to be to the following specifications:

- **Standard weight Tree Protection Fencing**

Where the drawing at Appendix I indicates standard weight tree protection fencing (protecting roots of tree 022) it must meet the following specification:

- Welded mesh panels (2 metres high). These panels must be fixed to ground-driven stakes or pins, such that they cannot be easily moved back during the construction process.
- The panels shall be joined together using at least two anti-tamper couplers, installed so their removal is only possible from behind the fence (the tree side) – these fence couplers must be spaced apart by at least 1 metre.
- Fencing panels must be supported on their inner sides by stabiliser struts, with these attached to base plates that are secured with ground pins – to ensure that the fencing line cannot be readily moved during construction.

- **Lightweight Tree Protection Fencing**

Where the drawing at Appendix I indicates lightweight tree protection fencing, this is on existing land raised significantly above the build area's ground floor level (raised by approximately 2 m). There is no realistic or practical prospect of machinery access or materials storage into this raised area. The purpose of the fencing is not therefore to prevent access, but is to

demarcate the outer edge of the tree RPAs – and therefore the absolute limit of excavation. For this primarily visual purpose a bright orange flexible mesh fencing will suffice, positioned according to the dimensions shown, and supported by firmly driven site pins placed at spacings not exceeding 1.5 m.

For both standard weight and lightweight fencing specifications, all-weather notices must be affixed at spacings no greater than 5 m, with the following wording: *'Fencing for the protection of tree roots and rooting soil – no construction access or storage permitted behind this fencing'*.

5.3 Construction access and materials' storage

Construction access is uncomplicated, via the existing main drive. An obvious potential area for materials' storage is shown on the drawing at Appendix I, though any of the hard-surfaced areas around the house could be used without risk to trees.

6. Arboricultural Method Statement

6.1 Tree work requirements

No tree removals are specified.

Up to three trees may require removal of minor low branches to improve clearance for construction access:

- Tree 023 (lime). May require pruning of a few minor low-hanging branch ends, to improve construction access clearance. This would require no more than 6 pruning cuts, none of which need exceed 40 mm diameter.
- Tree 024 (cherry). May require one low branch removal to improve construction access clearance. Image taken to show required pruning cut location – see Photographs section.
- Tree 025 (yew). Will require pruning of a few minor south-westerly branches, to improve construction access clearance. This will require no more than 7 pruning cuts, none of which need exceed 40 mm

diameter (most will be much smaller). This will have no significant effect on tree health.

All tree pruning work must be carried out in accordance with *BS 3998: 2010 Tree work – recommendations*[2].

6.2 Implementation of Tree Protection plan

The requirements of the Tree Protection Plan must be implemented in full prior to the commencement of any construction work (Section 5).

6.3 Services, utilities and drainage

Where rainwater and foul drainage and electric and any other underground services connect to the existing infrastructure, this must be outside of all trees' Root Protection Areas (RPAs). Any new trenching or other excavation for these must be outside of all tree RPAs. See drainage plan supplied by architect at Appendix J.

6.4 Rainwater guttering

On both sides of the building - but particularly the north side – the design of gutters must be such that leaf blockage problems do not arise.

6.5 Ivy on trees

For many of the trees on site, ivy obscures their stem bases. In most cases it is limited to the lower stem. This is not generally a problem, but for those trees which border the build area consideration should be given to removing that lower stem ivy. This will prevent the gradual spread of oppressively dark ivy cover, and will make future stem inspection possible. It must be done using hand tools only, taking great care not to damage the bark of the trees.

Permission is not required for the removal of ivy from TPO trees.

6.6 Removal of deadwood branches

Many of the trees on site have deadwood branches internal to their canopies. These are of high ecological value but are also more prone to failure. In most areas of the woodland they will present no significant risk and should usually be left as they are. Consideration should be given to removing any larger deadwood branches from above the main access drive.

Permission is not required for the removal of demonstrably dead branches from TPO trees.

6.7 Severing or exposing tree roots

As tree roots can extend well beyond the generic Root Protection Area defined in BS5837: 2012[1], it is likely that some minor roots will be encountered during excavations. If it is necessary to sever any of these individual minor roots (less than 25 mm diameter), this can be done using secateurs or a sharp handsaw. If small-diameter roots occur in clumps, or if roots exceed 25 mm diameter, they should only be severed after consultation with an appropriately qualified arboriculturist. (BS5837: 2012[1], 7.2.3).

Any roots that are exposed should be immediately covered to prevent drying out, and to protect them from sudden temperature changes. This is just as important during the colder months, when frost damage of roots is a significant risk. (BS5837: 2012[1], 7.2.2)

7. Other observations

7.1 Legal status of trees on site

Trees at this site are legally protected by Tree Preservation Order (TPO). The relevant legislation to these matters is contained within the Town and Country Planning Act 1990 [3] and The Town and Country Planning (Tree Preservation) (England) Regulations 2012 [4].

This report has not considered the requirements of the Forestry Act 1967 [5]: felling licences are required in some circumstances (regardless of protected status or not) – on this particular occasion they are not relevant.

7.2 Wildlife considerations and law

The requirements of the following legislation should also be considered in the planning of any arboricultural operations.

- Wildlife and Countryside Act 1981 [6]
- Countryside and Rights of Way Act 2000 [7]
- The Conservation of Habitats and Species Regulations 2010 [8]
- The Conservation of Habitats and Species (Amendment) Regulations 2011 [9]

One combined effect of the above legislation is that tree work operations must be planned to avoid disturbance to nesting, breeding or roosting birds, or to bats and their roosts. The nests of wild birds are protected whilst in use, and all 18 bat species found in the UK are afforded European Protected Species status.

7.3 Standards of tree work

Any tree work recommended in our reports should be carried out in accordance with the British Standard *BS 3998: 2010 Tree work – Recommendations* [2].

Reference List

1. British Standards Institution (2012) *BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations*. London, BSI Standards Ltd.
2. British Standards Institution (2010) *BS 3998: 2010 Tree work – Recommendations*. London, BSI Standards Ltd.
3. *Town and Country Planning Act 1990*. London, HMSO.
4. *The Town and Country Planning (Tree Preservation) (England) Regulations 2012*. London, HMSO.
5. *Forestry Act 1967*. London, HMSO.
6. *Wildlife and Countryside Act 1981*. London, HMSO.
7. *Countryside and Rights of Way Act 2000*. London, HMSO.
8. *The Conservation of Habitats and Species Regulations 2010*. London, HMSO.
9. *The Conservation of Habitats and Species (Amendment) Regulations* 2011. London, HMSO.

Photographs



Photo 1. Tree 024 (cherry). Showing the branch which is likely to require removal for construction access.



Photo 2. View of the existing garage, which is to be replaced. Photo taken looking towards the east.



Photo 3. Eastwards from the existing garage (behind car in this image) excavation of currently raised ground will be required. This is fully clear of all root Protection Areas.
Photo taken looking towards the northeast.

Appendix A: Tree Schedule (excluding Root Protection Areas and crown spread)

Table 1 (below) contains data for all trees, excluding Root Protection Areas and crown spread details – which are in Appendix B.
Condition categories, in ascending order of quality: poor – moderate – fair – good - very good

Tree Number	Species (common name)	Height (m)	Canopy clearance (m)	Life stage	Observations, and suggestions for management	Remaining contribution (years)	BS retention category	Condition (physiological : structural)
001	Beech	12	3	Early Mature	Thin open strip wound on north side, from 1.0 to 2.5 m height, with good woundwood formation. Acoustic testing with a nylon sounding hammer indicates that any associated decay is limited in extent such that it is not currently at all significant.	40+ Years	C1	Good : Fair
002	Sycamore	18	5	Mature	No significant issues observed.	40+ Years	B1	Good : Good
003	Sycamore	14	5	Early Mature	No significant issues observed.	40+ Years	C1	Good : Fair
004	Sycamore	16	3	Early Mature	No significant issues observed.	40+ Years	C1	Good : Fair
005	Sycamore	18	3	Early Mature	No significant issues observed.	40+ Years	C1	Good : Fair
006	Sycamore	18	2	Mature	No significant issues observed.	40+ Years	B1-	Good : Good
007	Sycamore	16	4	Early Mature	No significant issues observed.	40+ Years	C1	Good : Fair

Tree Number	Species (common name)	Height (m)	Canopy clearance (m)	Life stage	Observations, and suggestions for management	Remaining contribution (years)	BS retention category	Condition (physiological : structural)
008	Sycamore	18	3	Mature	On the north side of the stem a strip wound of approximately 50 mm width extends upwards for 1.0 metre from the stem base. This opens to a shallow vertical cavity, with the surrounding woundwood rolls being very substantial. Acoustic testing with a nylon sounding hammer indicates that any associated decay is limited in extent such that it is not currently significant.	40+ Years	C1	Good : Fair
009	Sycamore	17	4	Early Mature	Slender tree, arcing southwest a little more than its neighbours. This is just a natural growth form, not a concern in the woodland edge context.	40+ Years	C1	Good : Moderate
010	Sycamore	18	3	Early Mature	No significant issues observed.	40+ Years	B1-	Good : Good
011	Sycamore	18	7	Mature	No significant issues observed.	40+ Years	B1-	Good : Good
012	Sycamore	16	7	Early Mature	A particularly slender tree that would not be windfirm outside of the woodland context.	40+ Years	C1	Good : Moderate
013	Sycamore	17	4	Mature	A substantial tree, which has a noticeably heavy growth weighting/lean to the west. This is the natural consequence of the woodland edge location, and is not a structural concern.	40+ Years	B1-	Good : Fair

Tree Number	Species (common name)	Height (m)	Canopy clearance (m)	Life stage	Observations, and suggestions for management	Remaining contribution (years)	BS retention category	Condition (physiological : structural)
014	Sycamore	16	5	Early Mature	No significant issues observed.	40+ Years	C1	Good : Fair
015	Sycamore	16	4	Early Mature	No significant issues observed.	40+ Years	C1	Good : Fair
016	Sycamore	16	3	Early Mature	No significant issues observed.	40+ Years	C1	Good : Good
017	Ash	20	10	Mature	Substantial woodland tree. May ultimately succumb to Ash Dieback disease, though there are currently no visible symptoms. Weighted to the north-east.	20 to 40 Years	B1	Good : Fair
018	Ash	20	10	Mature	A substantial woodland tree. May ultimately succumb to Ash Dieback disease, though there are currently no visible symptoms.	20 to 40 Years	B1	Good : Fair
019	Ash	17	10	Early Mature	May ultimately succumb to Ash Dieback disease, though there are currently no visible symptoms.	20 to 40 Years	C1	Fair : Moderate
020	Lime	20	3.5	Mature	Tall and relatively slender, slightly weighted to northwest.	40+ Years	B1	Good : Good
021	Lime	20	2	Mature	Tall and relatively slender.	40+ Years	B1	Good : Good
022	Lime	20	3	Mature	A substantial tree growing on the woodland corner.	40+ Years	B1	Good : Good

Tree Number	Species (common name)	Height (m)	Canopy clearance (m)	Life stage	Observations, and suggestions for management	Remaining contribution (years)	BS retention category	Condition (physiological : structural)
023	Lime	20	3	Mature	A substantial tree at the woodland edge. May require pruning of a few minor low-hanging branch ends, to improve construction access clearance. This would require no more than 6 pruning cuts, none of which need exceed 40 mm diameter.	40+ Years	B1	Good : Good
024	Cherry	8	2.5	Early Mature	May require one low branch removal to improve construction access clearance. Photo taken to show required pruning cut location.	20 to 40 Years	C1	Fair : Fair
025	English Yew	7	3	Semi Mature	Will require pruning of a few minor south-westerly branches, to improve construction access clearance. This will require no more than 7 pruning cuts, none of which need exceed 40 mm diameter (most will be much smaller). This will have no significant effect on tree health.	40+ Years	C1	Fair : Fair

Appendix B: Tree Constraints Data - Root Protection Areas (RPAs) and crown spread

Table 2 (below) contains data for Root Protection Areas and crown spread for all trees – all other data is found in in Appendix A.

Tree Number	No. of stems	Diameter (mm) single stem	Diameter (mm) - 2 to 5 stems					Mean stem diameter (mm)	Calculated stem diameter (mm)	Radius of nominal circle (m)(from BS5837: 2012[1] Annex D)	RPA Area (m^2) (from BS5837: 2012[1] Annex D)	Crown spread (m)			
			stem 1	stem 2	stem 3	stem 4	stem 5	> 5 stems				north	south	east	west
001	1	270							270	3.3	34	3	6	3	3
002	1	530							530	6.6	137	3	8	3	6
003	1	420							420	5.1	81	0	8	2	5
004	1	270							270	3.3	34	2.5	2.5	2.5	2.5
005	1	340							340	4.2	55	0	8	1	3
006	1	420							420	5.1	81	0	8	4	3
007	1	380							380	4.8	72	0	6	2	3
008	1	480							480	6	113	0	6.5	4	4
009	1	200							200	2.4	18	0	5.5	0.5	3.5
010	1	390							390	4.8	72	1	6	3	6
011	1	410							410	5.1	81	1	6.5	3	4
012	1	250							250	3	28	0.5	3	0.5	3
013	1	580							580	7.2	163	5	5	0	8
014	1	360							360	4.5	64	1.5	1.5	3	6.5
015	1	280							280	3.6	41	2.5	2.5	2.5	2.5
016	1	300							300	3.6	41	3	4	4	5
017	1	500							10	0.9	3	4.5	4	5	4.5
018	1	610							610	7.5	177	7	7.5	7	7.5
019	1	340							340	4.2	55	0	6	0	6
020	1	420							420	5.1	81	6	2	4	2
021	1	470							470	5.7	102	4.5	2.5	2.5	4.5
022	1	740							740	9	255	5.5	3	3	6.5
023	1	800							800	9.6	290	6	6	6	6
024	1	230							230	3	28	4.5	4.5	0	4
025	3		150	120	100				217	2.7	23	3	3	3	3

Appendix C: Key to botanical names

Cherry	- *Prunus* spp.
Common ash	- *Fraxinus excelsior*
Common beech	- *Fagus sylvatica*
Common lime	- *Tilia x europaea*
Sycamore	- *Acer pseudoplatanus*
Yew	- *Taxus baccata*

Appendix D: Tree retention categories

Trees are assessed for their retention categories in the order in which those categories appear in Table 3 below – with all trees initially assessed against the criteria for category 'U', followed sequentially by categories 'A', 'B' and 'C'. Table 3 is based on Table 1 of BS5837: 2012 [1]; some but not all of the text is necessarily reproduced verbatim.

Trees that are not suitable for retention			
Category U Trees whose condition means that their retention as living trees beyond 10 years is unrealistic in the context of the current land use	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 category U trees (where, for example, 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 nearby trees, or very low quality trees suppressing better adjacent trees. In some circumstances, category U trees may have conservation value which it might be desirable to preserve, despite tree condition.		
Trees whose retention should be prioritised			
	1. **Predominantly arboricultural merit**	**2.** **Predominantly landscape merit**	**3.** **Predominantly cultural merit (includes conservation value)**
Category A High quality trees, currently with life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual. Also the essential trees within groups or formal or semi - formal arboricultural features (such as avenues' dominant or principal trees).	Trees, groups or woodlands that have particular visual importance as arboricultural and/or landscape features.	Trees, groups or woodlands that have significant conservation, historical, commemorative or other value (such as veteran trees or wood - pasture).

Trees whose retention should be considered (with Category B assuming the greater priority in retention decisions)			
	1. Predominantly arboricultural merit	**2. Predominantly landscape merit**	**3. Predominantly cultural merit (includes conservation value)**
Category B Moderate quality trees, currently with life expectancy of at least 20 years	Trees that are excluded from category A due to impaired condition (such as the presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention beyond 40 years. Also trees that simply lack the special quality necessary to merit the category A designation.	Trees present in numbers, often those growing as groups or woodlands, such that their collective rating is higher than that which they might attract as individuals. Also trees occurring as collectives but situated so as to make little visual contribution to the wider locality.	Trees that have material conservation or other cultural value.
Category C Low quality trees, currently with life expectancy of at least 10 years. Also young trees of stem diameter <150mm.	Trees that are unremarkable or of very limited merit, or that have such impaired condition that they do not qualify in higher categories.	Trees growing as groups or woodlands, but without this conferring on them significantly greater collective landscape value. Also trees offering low or only temporary/transient landscape benefits	Trees lacking any material conservation or other cultural value.

Appendix E: Calculating Root Protection Areas

Table 4. This table was used to establish Root Protection Areas (RPAs) in accordance with section 4.6.1 of BS5837: 2012[1], and Annex D of the same standard (from which this table's values are drawn). 'Stem diameter' refers to either the measured diameter of single stem trees, or the calculated combined stem diameter of multi-stem trees (BS5837: 2012[1], 4.6.1).

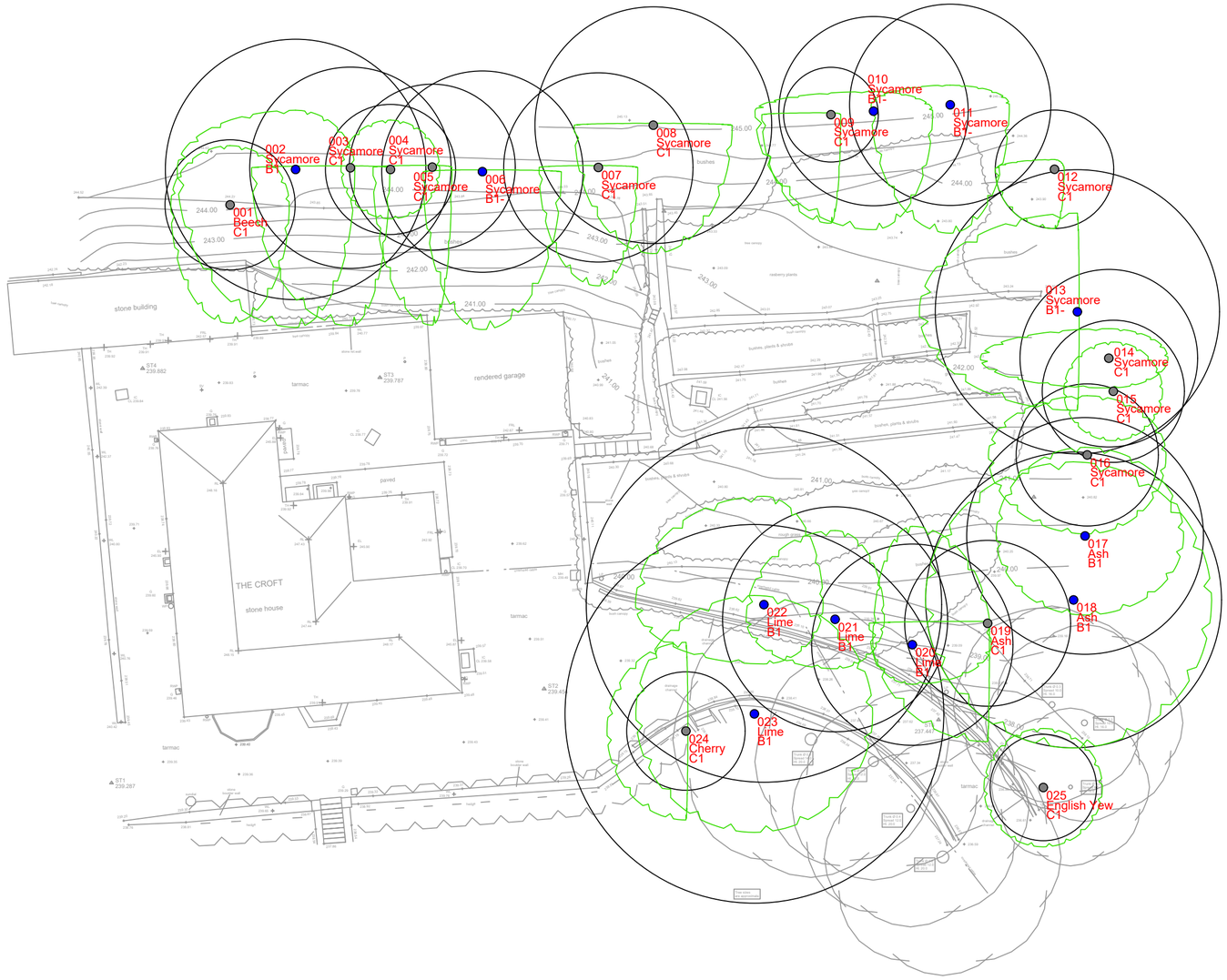
Stem diameter (mm)	Radius of a uniformly circular RPA (m)	RPA – area (m^2)
75	0.9	3
100	1.2	5
125	1.5	7
150	1.8	10
175	2.1	14
200	2.4	18
225	2.7	23
250	3.0	28
275	3.3	34
300	3.6	41
325	3.9	48
350	4.2	55
375	4.5	64
400	4.8	72
425	5.1	81
450	5.4	92
475	5.7	102
500	6.0	113
525	6.3	124
550	6.6	137
575	6.9	150
600	7.2	163
625	7.5	177
650	7.8	191

Stem diameter (mm)	Radius of a uniformly circular RPA (m)	RPA – area (m^2)
675	8.1	206
700	8.4	222
725	8.7	238
750	9.0	255
775	9.3	272
800	9.6	290
825	9.9	308
850	10.2	327
875	10.5	346
900	10.8	366
925	11.1	387
950	11.4	408
975	11.7	430
1000	12.0	452
1025	12.3	475
1050	12.6	499
1075	12.9	519
1100	13.2	547
1125	13.5	573
1150	13.8	598
1175	14.1	625
1200	14.4	652
1225	14.7	679
1250+	15.0	707

For the purpose of assessing development constraints the trees here are assessed individually. The trees are in many cases very similar, and the BS5837 categories are a fairly blunt tool for their assessment. Collectively they can be categorised as a Category B2 early-mature woodland. Woodland vitality is good, though vertical structure is somewhat lacking.
For many of the trees, ivy obscures their stem bases. In most cases it is limited to the lower stem.
Given the significant gradient to the site, canopy clearance is assessed relative to the particular tree's stem base.

The principle canopy species by far is sycamore. There are also small numbers of ash, beech and lime. Holly, box, elm and elder are all present in the understorey.
The canopy trees have been planted densely and seemingly not thinned at the appropriate intervals, such that this is to a certain extent an overly dense woodland.
The dense planted woodland continues for a considerable distance northwards from trees 1 to 11. The next trees to the north are approximately 4 metres north of those which have been individually surveyed. These un-surveyed trees to the north do not present any constraints to the proposed development area.
Similar observations to those above can be applied to trees eastwards from surveyed trees 12 to 17, though the distance to the boundary is far less.

Many of the trees have deadwood branches internal to their canopies. These are of high ecological value but are also more prone to failure. Consideration should be given to removal of larger deadwood branches where there is regular traffic/occupancy beneath. This is probably most relevant to the main access drive.
Consideration should also be given to removing lower stem ivy from those trees which border the proposed development area. This should be done using hand tools only, and taking great care not to damage the bark of the trees.



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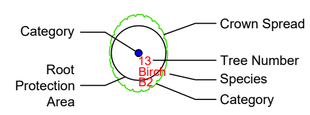
Site: The Croft, Thurlstone	1:200 at A2
Drawing Title: Appendix F - Tree Constraints Plan	September 2022

Key:

- Category A
- Category B
- Category C
- Category U



Notes:

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Revision: --

Revision List:

PRELIMINARY

0 10m

Project/ Client: The Croft / Costello

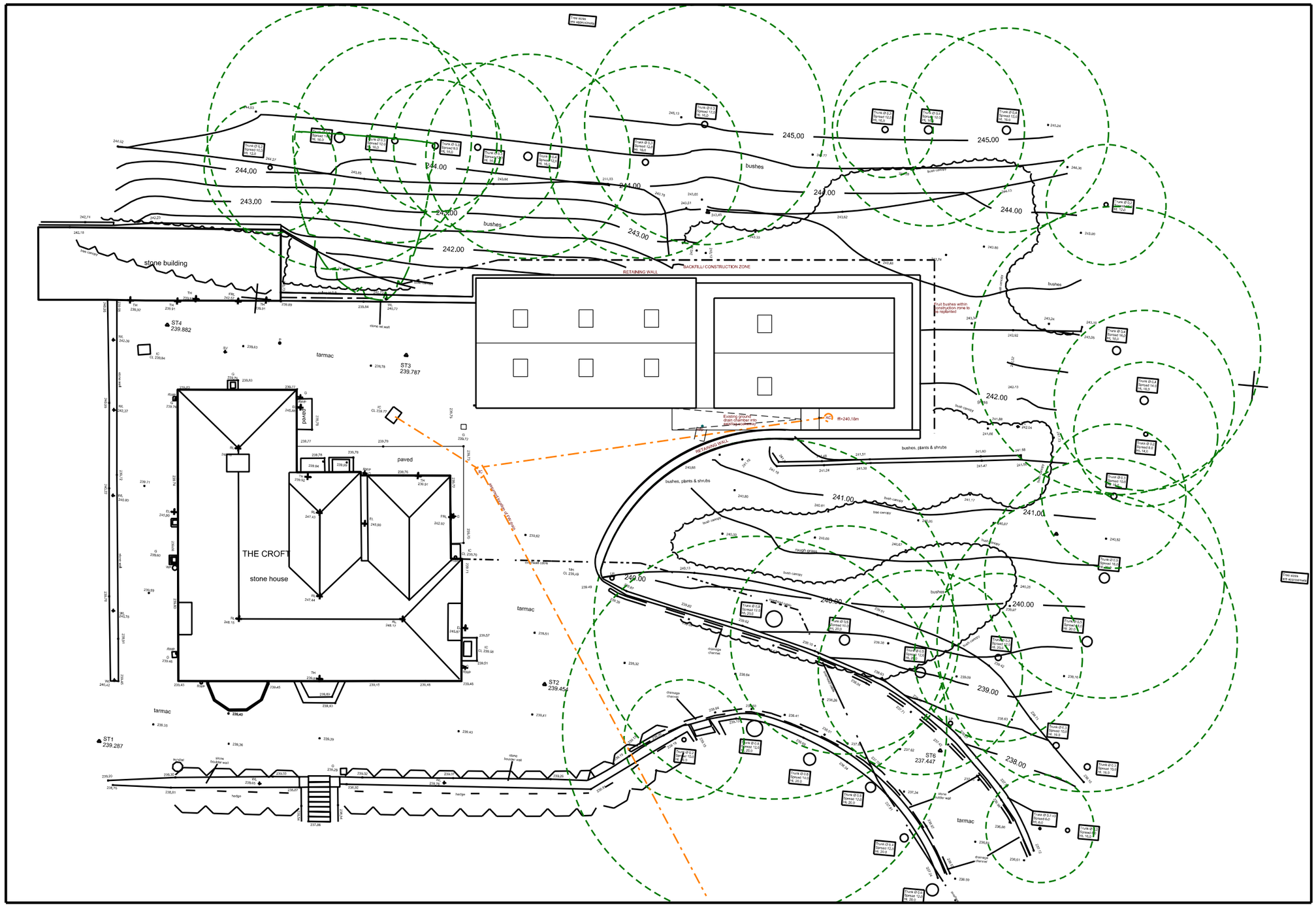
Drawing Title: Site Plan - PROPOSED

Drawing Number: 2143/TP/003

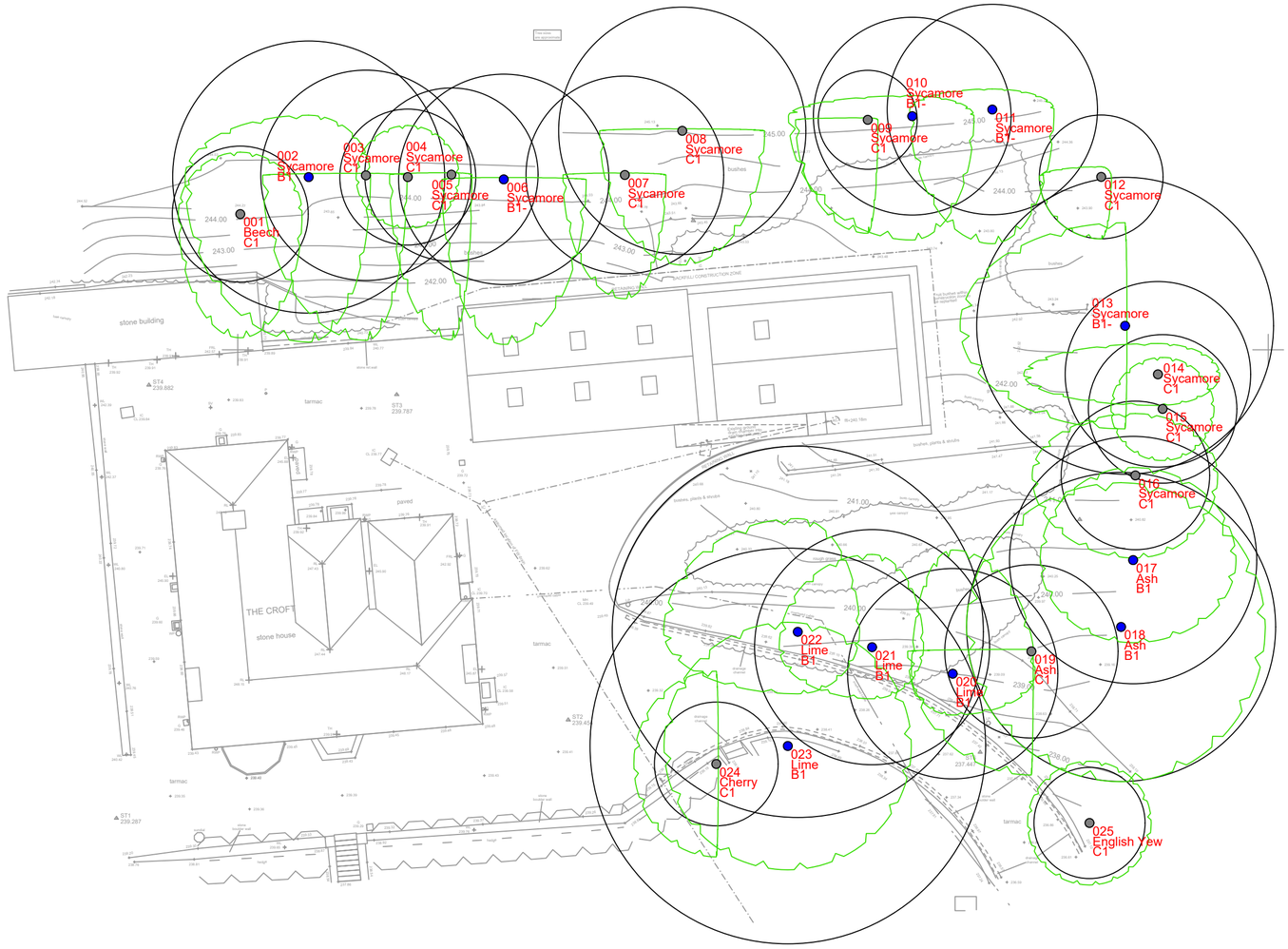
Scale at A3: 1:200

N

Date: Oct 22



The proposed development has been planned to fit around the surveyed tree constraints.
Root Protection Areas are to be entirely avoided.
The construction works and materials' storage can practically be undertaken without any need to access any currently unsurfaced parts of tree Root Protection Areas.
Canopy overhang of the building is minimal and height clearance is sufficient.
Gutter design will be selected so as to avoid leaf blockages.



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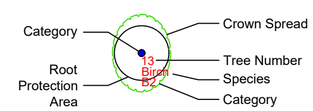
Site: The Croft, Thurlstone	1:200 at A2
Appendix H – Arboricultural Impact	Rev A, March 2023

Key:

- Category A
- Category B
- Category C
- Category U



5m 10m

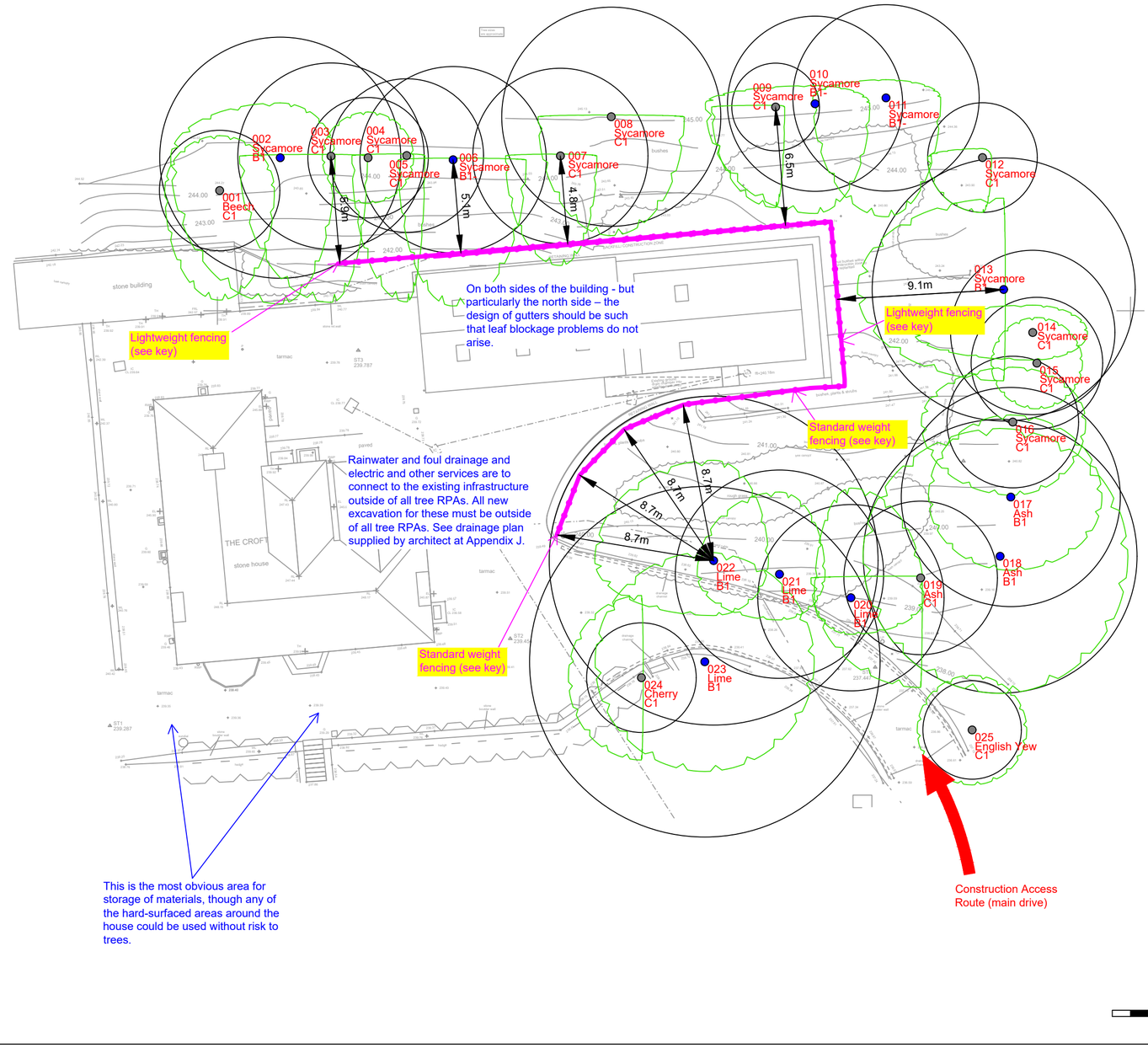
N

All this drawing's indicated tree protection fencing must be correctly installed prior to the commencement of any construction work or the delivery of any construction materials or machinery to site.
The primary purpose of the Tree Protection Plan is to prevent the serious and often irreversible harm that can be caused to trees through the compaction of their rooting soil. Compacted soil prevents root function, which causes tree decline or death. This decline is often gradual over a period of time, such that it is often not observed by the offending party. Harmful soil compaction can be caused by vehicles, machinery, footfall, or the weight of stored materials. Chemical spillages, bonfires, level raises and excavation are also all activities that can seriously harm tree roots. The abundant small and fine minor roots are of great importance to trees - these and the roots in general are found much closer to the soil surface than is often assumed.
Trees at this site are legally protected by Tree Preservation Order (TPO) with this protection including their roots as well as their above-ground parts.

For many of the trees on site, ivy obscures their stem bases. In most cases it is limited to the lower stem. This is not generally a problem, but for those trees which border the build area consideration should also be given to removing that lower stem ivy. This will prevent the gradual spread of oppressively dark ivy cover, and will make future stem inspection possible. It must be done using hand tools only, taking great care not to damage the bark of the trees.

Many of the trees on site have deadwood branches internal to their canopies. These are of high ecological value but are also more prone to failure. In most areas of the woodland they will present no significant risk and should usually be left as they are. Consideration should be given to removing any larger deadwood branches from above the main access drive.

Permission is not required for the removal of ivy or demonstrably dead branches from TPO trees.



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Site: The Croft, Thurlstone	1:200 at A2
Appendix I – Tree Protection Plan with Arboricultural Methodology requirements	Rev A, March 2023

Key:

- Category A
- Category B
- Category C
- Category U

Category — Crown Spread
13 Birch B1 — Tree Number
Root Protection Area — Species
Category

Tree Protection Fencing
Protective site fencing must be erected at the locations indicated, and according exactly to the dimensions shown on this drawing. This fencing must be in place prior to any works or deliveries of any materials/machinery to the site area. The fencing will be temporary - in place until all works are complete. Its purpose is to prevent compaction or other damage to the rooting areas of trees.

For this site, two specifications of tree protection fencing are shown – varying according to location. These are standard weight and lightweight variations – to be to the following specifications:

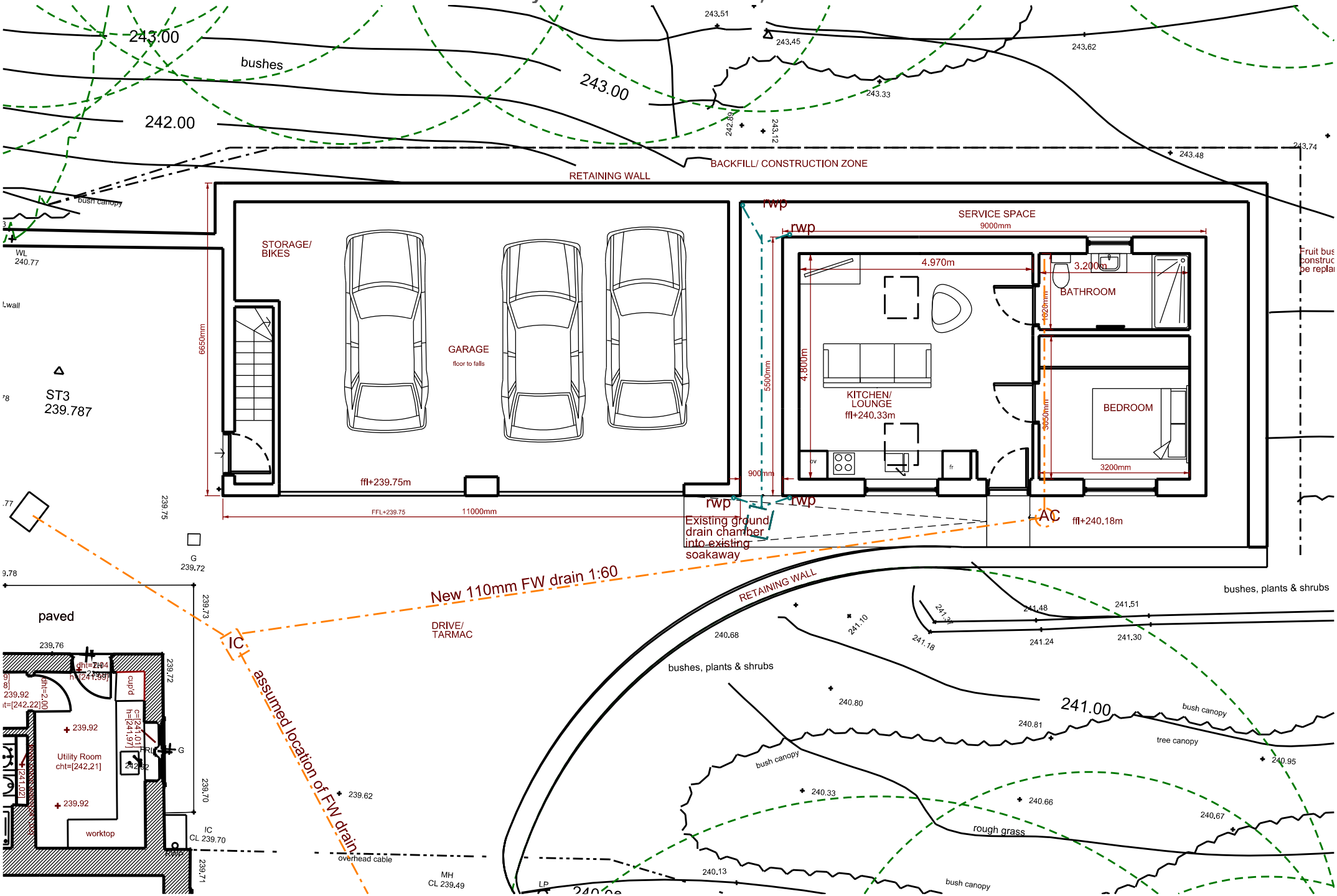
Standard weight Tree Protection Fencing
Where standard weight tree protection fencing is indicated (protecting roots of tree 022) it must meet the following specification:

- Welded mesh panels (2 metres high). These panels must be fixed to ground-driven stakes or pins, such that they cannot be easily moved back during the construction process.
- The panels shall be joined together using at least two anti-tamper couplers, installed so their removal is only possible from behind the fence (the tree side) – these fence couplers must be spaced apart by at least 1 metre.
- Fencing panels must be supported on their inner sides by stabiliser struts, with these attached to base plates that are secured with ground pins – to ensure that the fencing line cannot be readily moved during construction.

Lightweight Tree Protection Fencing
Where lightweight tree protection fencing is indicated, this is on existing land raised significantly above the build area's ground floor level (raised by approximately 2 m). There is no realistic or practical prospect of machinery access or materials storage into this raised area. The purpose of the fencing is not therefore to prevent access, but is to demarcate the outer edge of the tree RPAs – and therefore the absolute limit of excavation. For this primarily visual purpose a bright orange flexible mesh fencing will suffice, positioned according to the dimensions shown, and supported by firmly driven site pins placed at spacings not exceeding 1.5 m.

For both standard weight and lightweight fencing specifications, all-weather notices must be affixed at spacings no greater than 5 m, with the following wording: *'Fencing for the protection of tree roots and rooting soil – no construction access or storage permitted behind this fencing'.*

If printed for site use this drawing should be printed and used in colour and at the stated paper size.


243.00
bushes
243.00
242.00
243.51
243.45
243.62
243.33
242.89
243.12
243.48
243.74
BACKFILL/ CONSTRUCTION ZONE
RETAINING WALL
bush canopy
WL
240.77
STORAGE/
BIKES
GARAGE
floor to falls
6650mm
ST3
239.787
ffl+239.75m
FFL+239.75
11000mm
rwp
rwp
SERVICE SPACE
9000mm
4.970m
3.200m
BATHROOM
1020mm
4.800m
5500mm
KITCHEN/
LOUNGE
ffl+240.33m
BEDROOM
3650mm
3200mm
900mm
rwp
rwp
Existing ground
drain chamber
into existing
soakaway
AC
ffl+240.18m
Fruit bus
construc
be replai
239.75
G
239.72
New 110mm FW drain 1:60
RETAINING WALL
bushes, plants & shrubs
241.48
241.51
241.10
241.18
241.24
241.30
240.68
paved
239.76
239.73
DRIVE/
TARMAC
IC
assumed location of FW drain
bushes, plants & shrubs
240.80
241.00
bush canopy
240.81
tree canopy
240.95
239.92
Utility Room
cht=[242.21]
239.92
worktop
239.72
239.70
239.62
IC
CL 239.70
bush canopy
240.33
240.66
240.67
rough grass
overhead cable
MH
CL 239.49
240.13
bush canopy
239.71