

**Tree Survey in Relation to TIC for a
Proposed Residential Development on
Land at Floss Farm, Cleator**



Commissioned by: A2B Developments Limited

April 2019

To complete the objectives stated in this report, it was necessary for OpenSpace to base our conclusions on the best information available during the period of the project and within the limits prescribed by our client in the agreement. This report is guided by CIEEM Guidelines for Ecological Report Writing.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. We therefore cannot guarantee that the investigations fully identified the degree or extent of e.g. species presence or habitat management efficacy described in this report.

Document Information

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Tree Survey for a Proposed Residential Development on Land at Flosh Farm, Cleator

1 PROJECT BACKGROUND

This tree survey has been commissioned by A2B Developments Limited in relation to an outline planning application for a proposed residential development on land at Flosh Farm in Cleator. As the proposal is for outline planning only there are only outline plans available and the survey is for general reference only. The proposal is for seven residential dwellings, with associated access and landscaping.

The development is likely to affect a number of trees adjacent to the site. The site is not in a conservation area; however, there is a TPO (TPO27) on a group of trees in the south-eastern section of the field and includes the trees around the adjacent hotel (see Figure 2.3).

2 SCOPE OF SURVEY AND METHODOLOGY

The tree survey aims to make a reasoned judgement as to the importance of all trees with consideration for their conservation and landscape value. The survey area (shown in the existing plan Figure 2.1 and the aerial photo in Figure 2.3) considered all trees within the site and by the site boundary that may be affected by the proposed development (see Figure 2.2 for the outline proposed development plan).

The inspection method was a standard Visual Tree Assessment (VTA) from ground level. The survey investigated the condition of each tree, including tree species, tree health, evidence of pathogens, tree structure, tree age (estimate), tree size and other observations on condition and use. Diane Dobson (BSc., MSc., MCIEEM) and Jonathan Rook (Ad.DipEnvSc, MEnvSc) undertook the assessment, with over 15 years combined tree survey experience. Tree categorization was in accordance to guidance within **BS 5837:2012 'Trees in Relation to Construction'** where an assessment was reached on the quality of each tree.

Figure 2.1. Plan showing existing area of proposed development

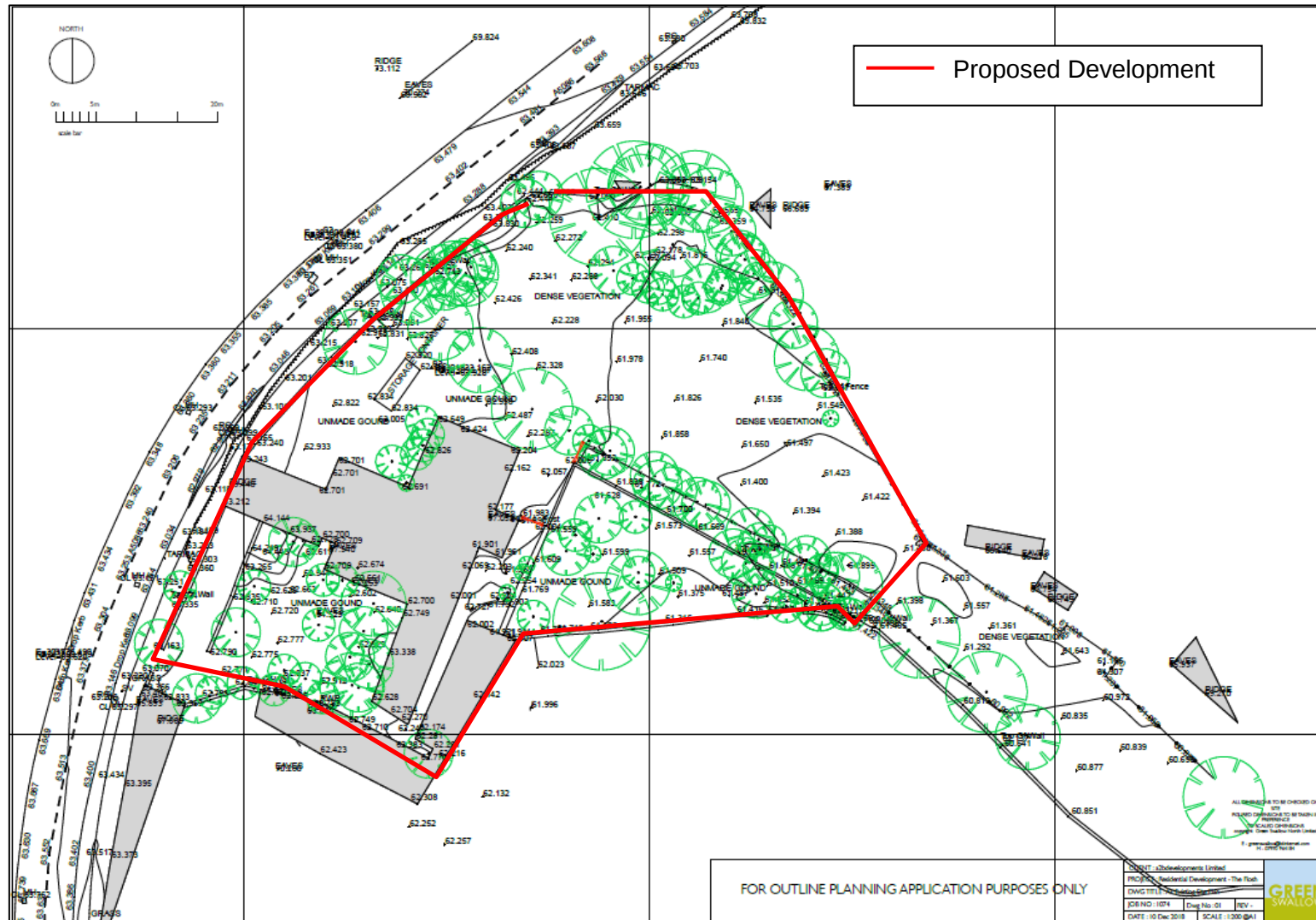


Figure 2.2. Plan showing indicative outline plan of proposed development

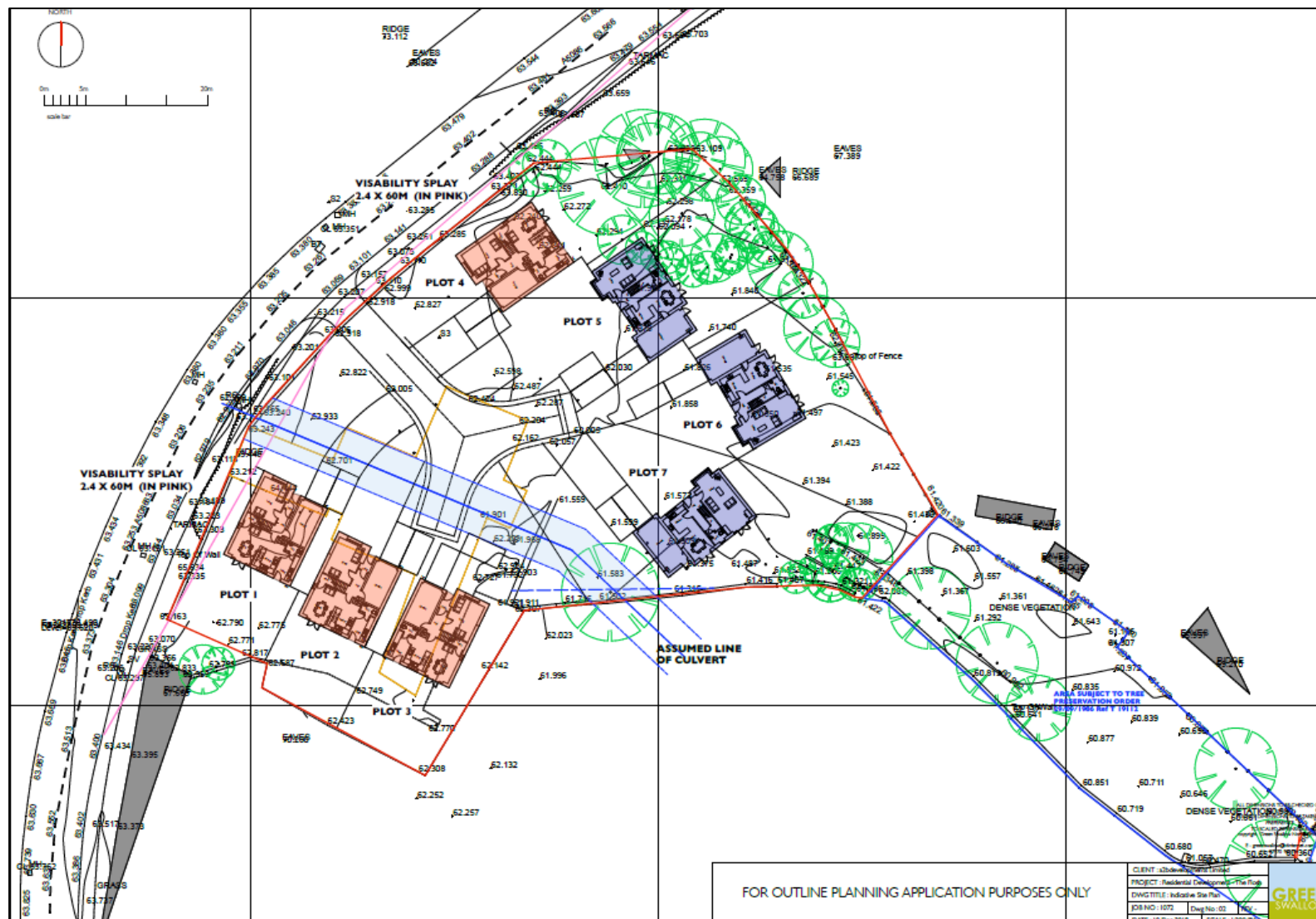


Figure 2.3. Aerial map of the site (showing proposed development footprint outlined in red and the TPO27 Group/Woodland outlined in blue)



3 RESULTS OF SURVEY

The daytime survey was undertaken on 19th and 20th March 2019 by Diane Dobson (Diane has over 11 years surveying trees and ecology consultancy).

3.1 Tree Results

Seventy-one trees were surveyed mostly within the site (Tree 71 is just outside the northern boundary), with three groups (Group 1-3) of trees within defunct hedge-lines within the site having the girth measurement taken. Four other trees within the southern section of the site within TPO27 had the girth measurement taken. Of the seventy-one surveyed trees, thirty-three trees were considered to be Category C, three trees considered to be Category B and thirty-five trees considered to be Category U (see Figure in Appendix Four for tree categories and Appendix One for explanation of the categories). Three trees T31-T33 are in TPO27. Since the survey was undertaken in early spring, canopy and leaf cover could not be assessed. It should be noted that only the trees over 150mm stem diameter at a height of 1.5m were surveyed. General tree descriptions are

provided in Table 3.1 on page 5; for further comments on trees see Appendix Three.
Photos are provided on in Appendix Two.

Table 3.1. Tree Identification Data

No	Species	Height (m)	Diam. @1.5m (mm), at root flare for stem =*	No. of stems, M=multi-stemmed	N radius (m)	S radius (m)	E radius (m)	W radius (m)	Age Class	Tree age (years)	Remaining contribution (years)	Physiological condition	Structural condition	RPA radius (m)	RPA (m ²)	Category
T1	Sycamore <i>Acer pseudoplatanus</i>		210 90								<10	P	P-F	2.7	13	U
T2	Sycamore <i>Acer pseudoplatanus</i>	13	240	1	2	4	3	3	Y	30+	10-20	P-F	F	3.0	28	C
T3	Sycamore <i>Acer pseudoplatanus</i>		310 190 180								<10	P-F	P	5.7	102	U
T4	Sycamore <i>Acer pseudoplatanus</i>		270								<10	P	P-F	3.3	34	U
T5	Sycamore <i>Acer pseudoplatanus</i>	15	210	1	2	1	2	3	Y	20-30	10-20	P-F	P-F	2.4	18	C
T6	Sycamore <i>Acer pseudoplatanus</i>	15	200	1	2.5	1	3	2	Y	20-30	10-20	F	P-F	2.4	18	C
T7	Sycamore <i>Acer pseudoplatanus</i>		310 280								<10	P-F	P	5.1	81	U
T8	Sycamore <i>Acer pseudoplatanus</i>	14	240	1	4	3	4	1	SM	30+	10-20	P-F	F	3.0	28	C
T9	Sycamore <i>Acer pseudoplatanus</i>		250 260								<10	P	P	4.2	55	U
T10	Sycamore <i>Acer pseudoplatanus</i>	13	180	1	1	2.5	0.5	2.5	Y	20-30	10-20	F	F	2.1	14	C
T11	Willow species <i>Salix</i> sp.											P	P			U

No	Species	Height (m)	Diam. @1.5m (mm), at root flare for stem ii	No. of stems, M=multi-stemmed	N radius (m)	S radius (m)	E radius (m)	W radius (m)	Age Class	Tree age (years)	Remaining contribution (years)	Physiological condition	Structural condition	RPA radius (m)	RPA (m ²)	Category
T12	Sycamore <i>Acer pseudoplatanus</i>	15	280	1	3	2	2	1	SM	30-40	10-20	P-F	F	3.3	34	C
T13	Sycamore <i>Acer pseudoplatanus</i>		160 210								<10	P-F	P	3.3	34	U
T14	Sycamore <i>Acer pseudoplatanus</i>		220								<10	P	P-F	2.7	23	U
T15	Willow species <i>Salix</i> sp.		450*								<10	P	P	4.5	64	U
T16	Sycamore <i>Acer pseudoplatanus</i>	12	170	1	2	1	2	2	Y	20-30	10-20	P-F	F	2.1	14	C
T17	Sycamore <i>Acer pseudoplatanus</i>	13	190	1	1	3	3	2	Y	20-30	10-20	F	F	2.4	18	C
T18	Sycamore <i>Acer pseudoplatanus</i>		540*								<10	P	P	5.4	92	U
T19	Sycamore <i>Acer pseudoplatanus</i>	14	245	1	2	2	2.5	3	Y	20-30	10-20	F	F	3.0	28	C
T20	Sycamore <i>Acer pseudoplatanus</i>	12	170	1	1	2	3	2	Y	10-20	10-20	F	F-G	2.1	14	C
T21	Sycamore <i>Acer pseudoplatanus</i>	13	155	1	2.5	2	1	3	Y	10-20	10-20	F	P-F	1.8	10	C
T22	Sycamore <i>Acer pseudoplatanus</i>	13	155	1	1	0.5	2	2	Y	10-20	10-20	F	F	1.8	10	C
T23	Ash <i>Fraxinus excelsior</i>	14	190	1	4	3.5	3.5	2.5	Y	20	20+	F	F-G	2.4	18	C

No	Species	Height (m)	Diam. @1.5m (mm), at root flare for stem ii*	No. of stems, M=multi-stemmed	N radius (m)	S radius (m)	E radius (m)	W radius (m)	Age Class	Tree age (years)	Remaining contribution (years)	Physiological condition	Structural condition	RPA radius (m)	RPA (m ²)	Category
T24	Sycamore <i>Acer pseudoplatanus</i>										<10	P	P			U
T25	Sycamore <i>Acer pseudoplatanus</i>										<10	P	P			U
T26	Port-Oxford Cedar <i>Chamaecyparis lawsoniana</i>	16	540	1	2	2	2	2	SM	40-50	20+	F	F-G	6.6	137	C
T27	Sycamore <i>Acer pseudoplatanus</i>	12	270	1	1	1	3	4	SM	20-30+	10-20	P-F	P-F	3.3	34	C
T28	Sycamore <i>Acer pseudoplatanus</i>		320 320 350								<10	P-F	P	6.9	150	U
T29	Sycamore <i>Acer pseudoplatanus</i>											P	P			U
T30	Yew <i>Taxus baccata</i>	10	370	1	2	2	2	2	SM	40+	10-20	P-F	F-G	4.5	64	C
T31	Beech <i>Fagus sylvatica</i>	23	650	1	9	9	5	5	M	80+	20+	F	F-G	7.8	191	B
T32	Sycamore <i>Acer pseudoplatanus</i>		160 70								<10	P	P	2.1	14	U
T33	Sycamore <i>Acer pseudoplatanus</i>	14	265	1	0.5	5	1	2	SM	30	10-20	F	F	3.3	34	C
T34	Sycamore <i>Acer pseudoplatanus</i>	14	180	1	1	1.5	1.5	0.5	Y	10-20	10-20	F	F	2.1	14	C
T35	Sycamore <i>Acer pseudoplatanus</i>		90 145								<10	P	P	2.1	14	U

No	Species	Height (m)	Diam. @1.5m (mm), at root flare for stem ii	No. of stems, M=multi-stemmed	N radius (m)	S radius (m)	E radius (m)	W radius (m)	Age Class	Tree age (years)	Remaining contribution (years)	Physiological condition	Structural condition	RPA radius (m)	RPA (m ²)	Category
T36	Sycamore <i>Acer pseudoplatanus</i>	14	225	1	0.5	4	3	2	Y	20-30	20+	F	P-F	2.7	23	C
T37	Sycamore <i>Acer pseudoplatanus</i>		300 260								<10	P	P	4.8	72	U
T38	Willow species <i>Salix</i> sp.		225								<10	P	P	2.7	23	U
T39	Sycamore <i>Acer pseudoplatanus</i>		270								<10	P	P	3.3	34	U
T40	Sycamore <i>Acer pseudoplatanus</i>		250 300 170								<10	P	P	5.1	81	U
T41	Willow species <i>Salix</i> sp.		90 145								<10	P	P	2.1	14	U
T42	Willow species <i>Salix</i> sp.		350								<10	P	P	4.2	55	U
T43	Sycamore <i>Acer pseudoplatanus</i>	16	345	1	4	4	4	4	SM	30-40	20+	F	G	4.2	55	B
T44	Sycamore <i>Acer pseudoplatanus</i>	16	260 290 250	3	4	4	4	4	SM	50+	10-20	F	P	5.4	92	C
T45	Sycamore <i>Acer pseudoplatanus</i>	14	180	1	1.5	2.5	1.5	1	Y	10	20+	F	F-G	2.1	14	B
T46	Sycamore <i>Acer pseudoplatanus</i>		230								<10	P-F	P	2.7	23	U
T47	Sycamore <i>Acer pseudoplatanus</i>	15	320	1	4	4	4	3	SM	30+	10-20	F	F	3.9	48	C

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T48	Sycamore <i>Acer pseudoplatanus</i>										<10	P	P			U
T49	Ash <i>Fraxinus excelsior</i>	17	200	1	0.5	1.5	3	1	Y	10-20	20+	F	F	2.4	18	C
T50	Ash <i>Fraxinus excelsior</i>	17	260	1	1	4	1	4	SM	20-30+	10-20	F	F	3.0	28	C
T51	Sycamore <i>Acer pseudoplatanus</i>		230 90								<10	P-F	P	3.0	28	U
T52	Sycamore <i>Acer pseudoplatanus</i>	13	200	1	2	2	3	3	Y	10-20	10-20	F	F	2.4	18	C
T53	Ash <i>Fraxinus excelsior</i>	12	150	1	1	2.5	2.5	2	Y	10-20	10-20	F	F	1.8	10	C
T54	Sycamore <i>Acer pseudoplatanus</i>	17	300	1	4	5	2	1.5	SM	30+	10-20	P-F	P-F	3.6	41	C
T55	Ash <i>Fraxinus excelsior</i>		190 400 170								<10			5.7	102	U
T56	Holly <i>Ilex aquifolium</i>	12	330	1	3	3	3	2.5	SM	30+	10-20	P	F	3.9	48	C
T57	Sycamore <i>Acer pseudoplatanus</i>		160 225 140									P-F	P	3.6	41	U
T58	Sycamore <i>Acer pseudoplatanus</i>	17	340	1	4	5	3	3	SM	30-40	10-20	F	F	4.2	55	C
T59	Atlantic White Cedar <i>Chamaecyparis</i>	16	340	1	1.5	1.5	1.5	1.5	SM	30-40	20+	F	F	4.2	55	C

No	Species	Height (m)	Diam. @1.5m (mm), at root flare for stem ii*	No. of stems, M=multi-stemmed	N radius (m)	S radius (m)	E radius (m)	W radius (m)	Age Class	Tree age (years)	Remaining contribution (years)	Physiological condition	Structural condition	RPA radius (m)	RPA (m ²)	Category
	<i>thyroides</i>															
T60	Sycamore <i>Acer pseudoplatanus</i>	20	640 290	2	6	7	6	6	M	80+	10-20	P-F	P-F	8.4	222	C
T61	Yew <i>Taxus baccata</i>										<10	P	P			U
T62	Yew <i>Taxus baccata</i>										<10	P	P			U
T63	Sycamore <i>Acer pseudoplatanus</i>		220 440 190								<10	P-F	P	6.3	124	U
T64	Sycamore <i>Acer pseudoplatanus</i>	17	290 280 200	3	3	3	5	6	EM	60+	10-20	F	P	5.4	192	C
T65	Sycamore <i>Acer pseudoplatanus</i>	18	330 410 210	3	2	2	5	5	EM	60+	10-20	P-F	P	6.9	150	C
T66	Sycamore <i>Acer pseudoplatanus</i>		160 280								<10	P	P	3.9	48	U
T67	Sycamore <i>Acer pseudoplatanus</i>	18	360 300	2	2	2	5	5	SM	50+	10-20	P-F	P	5.7	102	C
T68	Yew <i>Taxus baccata</i>		470 360								<10	P	P	7.2	163	U
T69	Sycamore <i>Acer pseudoplatanus</i>		170								<10	F	P	2.1	14	U
T70	Hazel <i>Corylus avellana</i>										<10	P	P			U

No	Species	Height (m)	Diam. @1.5m (mm), at root flare for stem ii	No. of stems, M=multi-stemmed	N radius (m)	S radius (m)	E radius (m)	W radius (m)	Age Class	Tree age (years)	Remaining contribution (years)	Physiological condition	Structural condition	RPA radius (m)	RPA (m ²)	Category
71	Ash <i>Fraxinus excelsior</i>	Tree outside site boundary – likely to be in third-party ownership									<10	P-F	P			C
Gp1	Group of about 15 trees (plus a number of trees under 150mm) forming part of an old defunct hedge-line – with Beech, Sycamore and Ash.		830* 370/34 0 120/11 0/70 530* 850* 220/20 0 360* 780* 205 650* 420* 170 210 220/14 0/170											8.3 6.0 2.1 5.3 8.5 3.2 3.3 3.6 7.8 2.4 6.5 4.2 2.1 2.4 3.3	217 113 14 88 227 32 34 41 191 18 133 55 14 18 34	
Gp2	Line of seven Yews along eastern site boundary – part of defunct hedge-line		170 180/14 0 300 360/17 0 200											2.1 2.7 3.6 4.8 2.4 4.8 4.8	14 23 41 72 18 72 72	

No	Species	Height (m)	Diam. @1.5m (mm), at root flare for stem ii*	No. of stems, M=multi-stemmed	N radius (m)	S radius (m)	E radius (m)	W radius (m)	Age Class	Tree age (years)	Remaining contribution (years)	Physiological condition	Structural condition	RPA radius (m)	RPA (m ²)	Category
			410 410													
Gp3	Line of about 10 Yews (plus trees under 150mm) – part of defunct hedge		165 170/19 0 210/19 0 160/16 0 220 230/20 0 150 410* 15020 0/210/ 70											2.1 3.0 3.3 2.7 2.7 3.6 1.8 4.1 1.8 3.6	14 28 34 23 23 41 10 53 10 41	
5 TPO trees	Three Sycamore, one Beech and one Yew in southern section of site		680 720/46 0 680 480 680											8.1 10.2 8.1 5.7 8.1	206 327 206 102 206	

4 TREE ASSESSMENT AND RECOMMENDATIONS

4.1 Tree Assessment

The surveyed trees were mostly within the proposed development site, with the exception of Tree 71, which is just outside the northern boundary. From the Copeland District Council “my maps” webpage, the site is not in a conservation area but the trees in the south-eastern section of the field are in TPO 27, (the TPO includes the trees within the grounds of the adjacent hotel) (see Figure 2.3).

4.2 Removal of Trees Due to Poor Health or Quality

Thirty plus trees on site (Trees T1, T3, T4, T7, T9, T11, T13-T15, T18, T24, T25, T28, T29, T35, T37-T42, T46, T48, T51, T55, T57, T61-T63, T65, T66, T68-T70, most of Group 1 and half of Group 3) could be removed due to poor health and/or poor structure. These trees show defects, which would reduce their life expectancy. Most of the trees are self-sown specimens with a number of defects. Due to the number of trees for removal and visibly from the main road, hotel and adjacent dwellings, the removal of these trees is considered to be of high visual impact.

Tree T55 has some potential for bat roosts, including dense ivy present. This was difficult to assess fully without climbing the tree. If this tree is proposed for removal then the tree should be inspected or surveyed for roosting bats before its removal. There may be a requirement to undertake a full bat survey. If bat potential is determined then bat boxes should be put up in larger retained trees to compensate for the loss of a potential bat roosting area.

4.3 Removal of Trees Due to Development

As there is an outline plan only, the tree survey is for general reference only. From the indicative plans 30+ trees (T5, T6, T8, T10, T12, T16, T17, T19-T23, T26, T27, T30, T43, T44, T47, T49, T50, T52, T53, T60, one tree in Group 1 and the remainder of Group 3) are proposed for removal.

All the trees (except Tree T43) are of low to moderate quality and most are self-sown specimens. These require removal due to the proposed development. Tree T43 is of moderate to good quality and would require removal due to the proposed development. Due to the number of trees for removal and visibly from the main road, hotel and adjacent dwellings, the removal of these trees is considered to be of high visual impact.

Tree 71 is outside the site boundary and likely to be in third-party ownership. This would require removal due to the visibility splay. An agreement would need to be reached with the third-party for removal of this tree.

If any proposed development requires the removal of a large number (for example over five in number) of trees or removal of mature/large trees, the overall impact on visual landscape amenity would be considered at least moderate.

The removal of the trees on site should be mitigated by planting native tree species. The tree planting should be incorporated within the landscape plan. The retention of the other trees on site would maintain some visual amenity value. The overall tree resource and local biodiversity would be enhanced by planting native tree species, with some native shrubs.

Trees T30 and T60 have potential for bat roosts, with dense ivy present. This was difficult to assess without climbing the trees. If any of these trees are proposed for removal then the trees should be inspected or surveyed for bats prior before their removal. There may be a requirement to undertake a full bat survey. If bat potential is established then suitable mitigation should be implemented with bat boxes installed in retained trees to compensate for the loss of a potential bat roosting features.

If the total number of trees felled exceeds 5 cubic metres of timber, in one calendar quarter then the owner may need to apply for a Forestry Commission felling licence.

4.4 Retained Trees

From the indicative plans, the proposed new build may impact on the RPA of retained trees (See Figure in Appendix Six for the RPA of the trees). Proposed fence/wall boundaries may impact on the RPA of Trees T2, T31, T56 and T58. The RPA of other trees is calculated outwith the proposed footprint; however, the RPA of some trees is close to the proposed construction footprint. The proposed development footprint has been designed to be outside of the TPO boundary.

The full impact of the proposed development on site trees will be determined when the final layout plan is presented at full planning application. Any landscaping proposals within the RPA must consider potential damage to roots.

4.5 Tree Protection Measures

To reduce and manage the potential impacts on all retained trees the following measures must be considered:

1. Construction to be directed away from retained trees.
2. No tree roots greater than 25mm to be cut.
3. Limited pruning of retained trees to be approved by the Tree Officer.
4. Permeable materials and Geogrid (or equivalent i.e. Geoweb) to be considered for the access into the site and any car parking area where in or near to RPAs.
5. All materials for construction and machinery stored outside all RPA of retained trees.
6. No construction vehicles to access near any retained trees.
7. Set up protection fencing along the edge of the RPA to stop machinery entering. Since there is a risk of machinery needing to access the RPA this report recommends a simple wooden post and plastic net fencing will be sufficient. If the works require greater impact outside of the site footprint then it would be necessary to install Full Tree Protective Fencing.
8. Where issues arise for root compaction wooden working boards should be used to protect the tree roots.
9. Trees should be felled between September and March. If felled trees are removed within the bird breeding season a detailed bird nest survey must be undertaken before any felling commences.
10. Any trees due for works that have potential for bat roosts must be inspected for bats prior to felling / works.
11. Any trees proposed for works or removal should be checked for squirrel dreys prior to removal.

This report recommends that a no-dig or hand-digging option be considered to reduce impact to tree roots where the works are located in or near the RPA. Where digging is to take place within the RPA, permission would need to be gained from the local planning authority to dig within the RPA.

Within the design, where possible, geogrid or geotextile (or equivalent i.e. Geoweb) and permeable materials to be considered for access into the site, gravel areas or paths where the construction impacts on RPAs of retained trees.

General Precautions

The following schedule provides general measures for all retained trees on site. These will be carried out before commencement of other site operations including erection of protective fencing. These are:

- All works will be carried out in accordance with the British Standard Institution (2010). BS3998:2010 Recommendations for Tree Work – recommendations. BSI, London.
- The specification for protective fencing will conform to British Standard Institution (2012). BS5837:2012 Trees in relation to Construction – recommendations. BSI, London.
- All protective measures signed off by arboricultural consultant.
- No vehicles will be allowed to enter areas to be protected by fencing.
- No materials that are likely to have an adverse effect on tree health such as oil, bitumen or cement will be stored or discharged within 10 metres of the trunk of a retained tree.

Follow other general measures as below:

- **Do not** store materials, plant or equipment within RPA.
- **Do not** move plant or vehicles within the RPA.
- **Do not** lean materials against, or chain plant to, the trunk.
- **Do not** cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.
- **Do not** repeatedly move / use heavy mechanical plant except on hard standing/ access road zone.
- **Do not** store spoil or building material, including chemicals and fuels, within this zone.
- **Do not** light fires under any tree canopy or within 20 metres of any tree to be retained.
- **Do not** empty cement washing or other chemicals within the RPA.
- **Do** contact the local authority tree officer or owner of the tree if excavation within RPA by machinery is unavoidable or not been agreed prior to works.
- **Do** protect any exposed roots uncovered within RPA with dry sacking.
- **Do** backfill with a suitable inert granular and top soil material mix as soon as possible on completion of the works.
- **Do** notify the local authority tree officer or the tree's owner of any damage.

4.6 Tree Recommendations

Any loss of tree resources on site should be mitigated by planting replacement trees. To enhance local biodiversity most tree planting should consider using native trees (or wildlife friendly ornamental species) in appropriate locations across the site. The trees should be located on an agreed Landscape Plan. For smaller trees, the tree planting should aim for a 1:1 ratio of replacement, with an additional ten trees to be considered as enhancement planting.

There are a number of larger mature trees on site. Since these trees are mature, a like-for-like replacement mitigation planting is not practical. If these trees are proposed for removal, the tree planting should consider larger trees for planting. Therefore, to mitigate for the removal of these trees this report suggests a two for one replacement with planting extra heavy standard trees.

To enhance local biodiversity the tree planting should consider using native trees (or wildlife friendly ornamental species) in appropriate locations across the site. The trees should be located on an agreed Landscape Plan.

Planting Recommendations

These species are appropriate for the location and all are native species (Ash has currently not been recommended due to the restrictions in place due to Ash Dieback). Planting native trees and shrubs will enhance the site for biodiversity.

Native tree species suggested:

Silver Birch (*Betula pendula*)

Wild Cherry (*Prunus avium*)

Rowan (*Sorbus aucuparia*)

Sessile Oak (*Quercus petraea*)

English Oak (*Quercus robur*)

Small tree/ shrub species suggested:

Hawthorn (*Crataegus monogyna*)

Hazel (*Corylus avellana*)

Holly (*Ilex aquifolium*)

Bird Cherry (*Prunus padus*)

Guelder Rose (*Viburnum opulus*)

Dog Rose (*Rosa canina* agg.)

Native ground flora could be planted using plug plants or selected seed sowing. The species should be chosen following a site visit in the spring to identify what species are present.

Other recommendations

Trees with bat roost potential may be removed as part of the development. If these trees are removed, subject to inspection, it is recommended that a minimum of two bat boxes per tree with potential removed are installed within the site in retained mature trees.

5 SUMMARY

As the proposed development at Flosh Farm, Cleator is for an outline planning application the current plans are indicative only. Since there are no final detailed proposed plans, the full extent of any proposed development and impact on trees on site cannot be concluded. However, considering the likely layout of the proposed development, the scheme will have a high impact on visual amenity and tree resource.

The proposed development may require the removal of a number of trees and may impact on the RPA of a number of retained trees. Where possible trees should be retained.

To compensate tree removal, new tree planting and planting should be allowed for in the landscape plan. There is an opportunity to enhance the site for biodiversity by planting native trees and shrubs. The tree resource on site could be enhanced by planting a mix of native tree species. If suitable tree planting is undertaken, this will suitably mitigate the impact of tree removal.

There may be an impact on the RPA of retained trees. It is important to ensure that any construction should follow **British Standard 5837:2012 trees in relation to construction** to avoid any damage to the retained trees.

6 REFERENCES/BIBLIOGRAPHY

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7 APPENDIX ONE: KEY TO TREE SCHEDULE

Tree ID No:	Relates to individual trees identified within the Tree Survey Plan.				
Species:	Common name (<i>Latin name</i>).				
Height:	Estimated height expressed in metres to the nearest half metre.				
Stem diameter:	Diameter of main trunk or stems of a multi-stemmed tree taken at 1.5m above ground level where this is measurable (where the stem diameter is affixed by a “*” this measurement has taken above the root flare for multi-stemmed trees where the stems cannot be measured). Measurement expressed in millimetres to the nearest 10mm.				
Branch Spread:	(N, S, E, W radius) Estimated crown radius expressed in metres to the nearest half metre. Where a trees crown is heavily asymmetrical, the crown radius for each cardinal compass point is given.				
Age Class	Y	Young - Less than one third of natural life expectancy			
	SM	Semi-mature - One thirds of natural life expectancy			
	EM	Early mature - Two thirds of natural life expectancy			
	M	Mature - More than two thirds of natural life expectancy			
	OM	Over mature			
No. of stems:	M = multi-stemmed				
Physiological Condition:	G = Good	F=Fair	P=Poor	D=Dead	
Structural Condition:	G = Good	F=Fair	P=Poor		
Estimated remaining					
Contribution:	Expressed in years (<10, 10+, 20+, 40+)				
Abbreviations:	#: Estimated	Ave: Average	A.G.L:	Above	ground level

Cascade chart for tree quality assessment, with the colour identification added (from BS5837:2012)

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category 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	- 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 (e.g. 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, or very low quality trees suppressing adjacent trees of better quality <i>NOTE</i> Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.			See Table 2 Dark Red
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2 Light green
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2 Mid blue
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2 Grey

BRITISH STANDARD

BS 5837:2012

Root Protection Area: This is the minimum Root Protection Area (RPA) recommended within the British Standards 5837: 2012 'Trees in relation to construction'. The RPA is an area (m²) equivalent to a circle with a specified radius. This is the minimum area in m², which should be left undisturbed.

Calculating the Root Protection Area (RPA), BS5837: 2012 Trees in relation to construction - Recommendations Number of stems	Calculation
Single stem tree	See Table D.1
Tree with more than one stem arising below 1.5m above ground level	RPA(m²) = a) For trees with two to five stems, the combined stem diameter should be calculated as follows: $\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 \dots + (\text{stem diameter } 5)^2}$ b) For trees with more than five stems, the combined stem diameter should be calculated as follows: $\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$
NOTE The 12 x multiplier is based upon NJUG and published works by Metheny and Clark.	

Notes:

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 or replacement through mitigation.

The calculated RPA should be capped to 707m², e.g. which is equivalent to a circle with a radius of 15m.

The RPA, for each tree (as determined in Table D.1 for single stemmed trees and equivalent resultant combined stem diameter for multi-stemmed trees – note for multi-stemmed trees where the stems are not measurable OpenSpace use the previous method of measuring the stem above the root flare (RPA(m²) = ((Basal diameter(measured immediately above root flare)(mm) x 10) / 1000) x 3.142)), should be plotted on the TCP taking full account of the following factors, as assessed by an arboriculturalist, which may change its shape but not its area whilst still providing adequate protection for the root system:

a) The likely tolerance of the tree to root disturbance, based on factors such as species, age and condition and presence of other trees.

b) The morphology and disposition of the roots, when known to be influenced by past or existing site conditions (e.g. presence of roads, structures and underground services).

c) The soil type and structure.

d) Topography and drainage.

e) Where any significant part of a tree's crown overhangs the provisional position of tree protection barriers, these parts may sustain damage during the construction period. In such cases, it may be necessary to increase the extent of tree protection barriers to contain and thereby protect the spread of the crown. Protection may also be achieved by access facilitation pruning. An arboriculturalist should assess the need for such measures, including the precise extent of pruning.

PLOTTING THE RPA – TABLE D.1 (from BS5837:2012)

Table D.1 Root protection areas

Single stem diameter mm	Radius of nominal circle m	RPA m ²	Single stem diameter mm	Radius of nominal circle m	RPA m ²
75	0.90	3	675	8.10	206
100	1.20	5	700	8.40	222
125	1.50	7	725	8.70	238
150	1.80	10	750	9.00	255
175	2.10	14	775	9.30	272
200	2.40	18	800	9.60	290
225	2.70	23	825	9.90	308
250	3.00	28	850	10.20	327
275	3.30	34	875	10.50	346
300	3.60	41	900	10.80	366
325	3.90	48	925	11.10	387
350	4.20	55	950	11.40	408
375	4.50	64	975	11.70	430
400	4.80	72	1 000	12.00	452
425	5.10	81	1 025	12.30	475
450	5.40	92	1 050	12.60	499
475	5.70	102	1 075	12.90	519
500	6.00	113	1 100	13.20	547
525	6.30	124	1 125	13.50	573
550	6.60	137	1 150	13.80	598
575	6.90	150	1 175	14.10	625
600	7.20	163	1 200	14.40	652
625	7.50	177	1 225	14.70	679
650	7.80	191	1 250+	15.00	707

NOTE These figures are derived from the calculations described in 4.6.

8 APPENDIX TWO: PHOTOS



Photo 1. Tree T1



Photo 2. Trees T2-T3



Photo 3. Trees T3-T6



Photo 4. Tree T7 and T8



Photo 5. Trees T9-T10 and T12-T14



Photo 6. Trees T9-T10



Photo 7. Tree T18



Photo 8. Trees T19-T21



Photo 9. Tree T22



Photo 10. Trees T23 and T24



Photo 11. Tree T25



Photo 12. Trees T26-T28



Photo 13. Tree T29



Photo 14. Tree T30



Photo 15 and 16. Group 1



Photo 17. Tree T31



Photo 18. Tree T32



Photo 19. Tree T33



Photo 20. Trees T35-T40



Photo 21. Trees T41 and T43



Photo 22. Tree T42



Photo 23. Tree T44



Photo 24. Tree T45



Photo 25. Trees T46 and T47



Photo 26. Trees T48-T51



Photo 27. Trees T52 and T53



Photo 28. Trees T54-T57



Photo 29. Trees T58-T60 and Group 3



Photo 30. Group 2



Photo 31. Group 3



Photo 32. Tree T63



Photo 33. Tree T64



Photo 34. Trees T65-T67



Photo 35. Tree T68



Photo 36. Tree T69



Photo 37. Tree T70



Photo 38. Tree T71



Photo 39. TPO27 Tree



Photo 40 and 41. TPO27 Trees



Photo 42 and 43. TPO27 Trees

9 APPENDIX THREE: TREE COMMENTS

Tree no.	Species	Comments
T1	Sycamore <i>Acer pseudoplatanus</i>	Weak joins. Contact wounds. Pruned in past with cuts healed/not healed.
T2	Sycamore <i>Acer pseudoplatanus</i>	Growing next to building. Weak joins. Pruned in past with cuts healed/not healed.
T3	Sycamore <i>Acer pseudoplatanus</i>	Three stems from near base. Weak joins. Contact wounds. Pruned in past with cuts healed/not healed. Open wound in limb.
T4	Sycamore <i>Acer pseudoplatanus</i>	Large wound in stem.
T5	Sycamore <i>Acer pseudoplatanus</i>	Weak joins. Contact wounds. Some restriction in growth due to surrounding trees. Some bat roost potential.
T6	Sycamore <i>Acer pseudoplatanus</i>	Leans to east. Some restriction in growth due to surrounding trees. Weak joins.
T7	Sycamore <i>Acer pseudoplatanus</i>	Two stems from near base. Weak joins. Open wound in stem.
T8	Sycamore <i>Acer pseudoplatanus</i>	Weak joins. Open wounds in limbs.
T9	Sycamore <i>Acer pseudoplatanus</i>	Two stems from about 0.5m. Weak joins. Open wounds in stem.
T10	Sycamore <i>Acer pseudoplatanus</i>	Some restriction in growth due to surrounding trees. Weak joins.
T11	Willow species <i>Salix</i> sp.	Multi-stemmed from near base. Weak joins. Dead limbs.
T12	Sycamore <i>Acer pseudoplatanus</i>	Growing close to barn. Weak joins. Pruned in past with cuts healed/not healed. Small open wound in stem.
T13	Sycamore <i>Acer pseudoplatanus</i>	Growing close to barn. Two stems from near base. Some restriction in growth due to surrounding trees. Weak joins.
T14	Sycamore <i>Acer pseudoplatanus</i>	Growing close to barn. Two stems from about 3m. Major weak joins.
T15	Willow species <i>Salix</i> sp.	Multi-stemmed from about 1.5m. Weak joins. Dead limbs. Contact wounds.
T16	Sycamore <i>Acer pseudoplatanus</i>	Two stems from about 2m. Some restriction in growth due to surrounding trees. Weak joins.
T17	Sycamore <i>Acer pseudoplatanus</i>	Some restriction in growth due to surrounding trees. Weak joins.
T18	Sycamore <i>Acer pseudoplatanus</i>	Three stems from about 0.75m. Open wound in stem. Weak joins. Contact wounds with building.

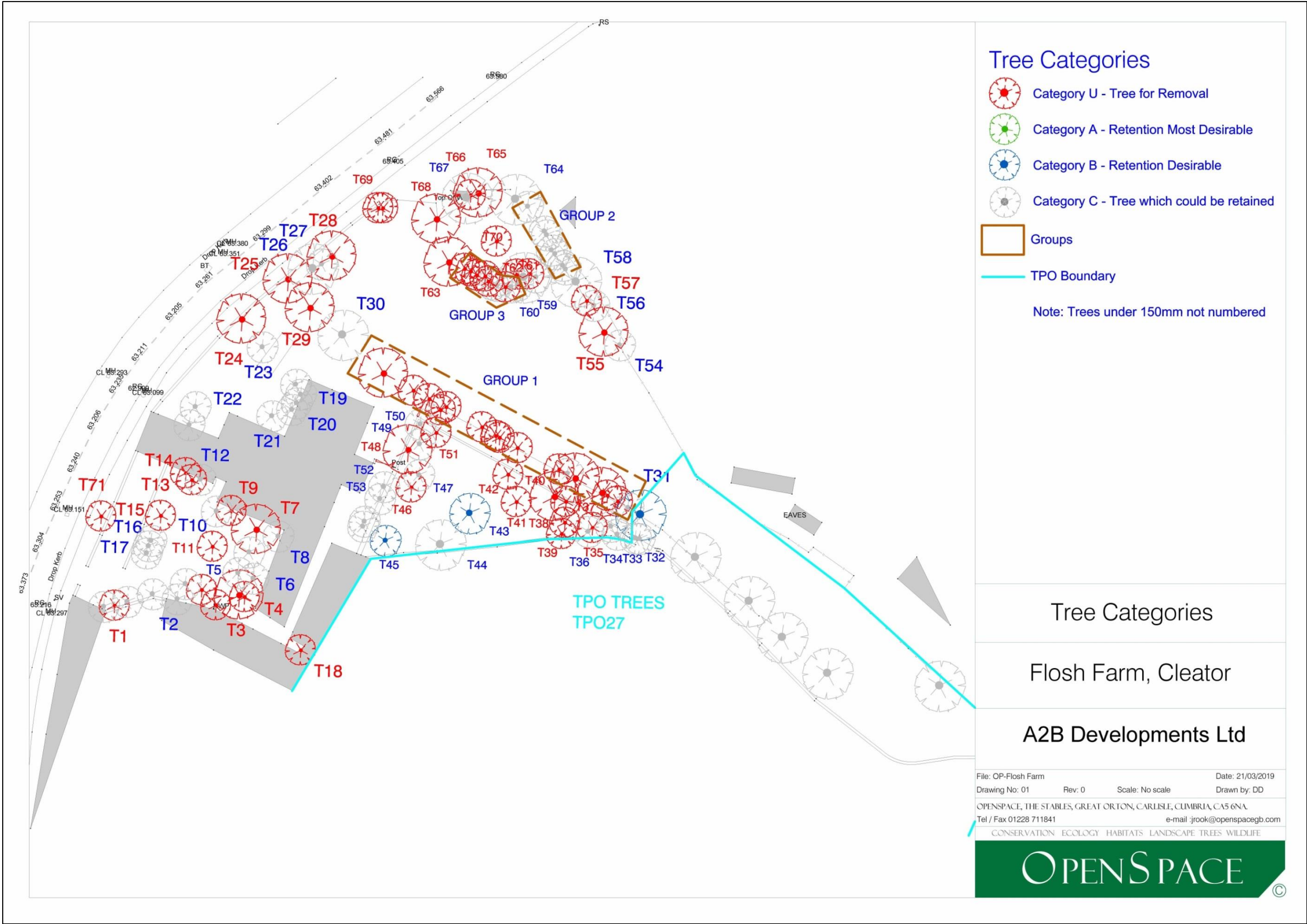
T19	Sycamore <i>Acer pseudoplatanus</i>	Growing next to building. Weak joins.
T20	Sycamore <i>Acer pseudoplatanus</i>	Growing next to building. Weak joins. Some restriction in growth due to surrounding trees.
T21	Sycamore <i>Acer pseudoplatanus</i>	Leans to north. Some restriction in growth due to surrounding trees. Weak joins.
T22	Sycamore <i>Acer pseudoplatanus</i>	Growing next to building. Some restriction in growth due to surrounding trees. Weak joins.
T23	Ash <i>Fraxinus excelsior</i>	Remains of stump. Weak joins.
T24	Sycamore <i>Acer pseudoplatanus</i>	Multi-stemmed. Ivy up stems Contact wounds. Weak joins. Open wounds in stems.
T25	Sycamore <i>Acer pseudoplatanus</i>	Multi-stemmed. Growing next to wall with contact wounds. Major weak joins. Occasional dead limb.
T26	Port-Oxford Cedar <i>Chamaecyparis lawsoniana</i>	Some restriction in growth due to surrounding trees. Some die-back of lower limbs.
T27	Sycamore <i>Acer pseudoplatanus</i>	Some restriction in growth due to surrounding trees – and overshadowed by T26. Occasional dead limb.
T28	Sycamore <i>Acer pseudoplatanus</i>	Two stems from near base, with one further stem from 1m. Dead limbs. Weak joins. Ivy up stem.
T29	Sycamore <i>Acer pseudoplatanus</i>	Multi-stemmed. Dead limbs. Weak joins. Ivy up stem.
T30	Yew <i>Taxus baccata</i>	Ivy up stem. Open wound in stem.
T31	Beech <i>Fagus sylvatica</i>	Good crown spread. Weak joins. Some bat roost potential.
T32	Sycamore <i>Acer pseudoplatanus</i>	Two stems from near base. Open wound in stem.
T33	Sycamore <i>Acer pseudoplatanus</i>	Some restriction in growth due to surrounding trees. Pruned in past with cuts healed/not healed. Occasional dead limb.
T34	Sycamore <i>Acer pseudoplatanus</i>	Some restriction in growth due to surrounding trees. Ivy up stem.
T35	Sycamore <i>Acer pseudoplatanus</i>	Two stems from near base. Weak joins. Some restriction in growth due to surrounding trees.
T36	Sycamore <i>Acer pseudoplatanus</i>	Leans to south. Some restriction in growth due to surrounding trees.
T37	Sycamore <i>Acer pseudoplatanus</i>	Two stems from near base. Major and minor weak joins. Dead limbs.

T38	Willow species <i>Salix</i> sp.	Dead limbs. Large open wounds.
T39	Sycamore <i>Acer pseudoplatanus</i>	Growing next to wall with contact wounds. Weak joins.
T40	Sycamore <i>Acer pseudoplatanus</i>	Three stems from near base. Contact wounds. Weak joins.
T41	Willow species <i>Salix</i> sp.	Two stems from near base. Large open wound in stem.
T42	Willow species <i>Salix</i> sp.	Fallen tree. Large open wound in stem.
T43	Sycamore <i>Acer pseudoplatanus</i>	Good crown spread. Ivy up stem. Occasional cracked off limb.
T44	Sycamore <i>Acer pseudoplatanus</i>	Three stems from near base. Pruned in past with cuts healed/not healed. Occasional dead limb. Weak joins.
T45	Sycamore <i>Acer pseudoplatanus</i>	Weak joins.
T46	Sycamore <i>Acer pseudoplatanus</i>	Leans to south-east. Ivy up stem. Some restriction in growth due to surrounding trees.
T47	Sycamore <i>Acer pseudoplatanus</i>	Two stems from about 3m. Ivy up stem.
T48	Sycamore <i>Acer pseudoplatanus</i>	Multi-stemmed. Major and minor weak joins. Open wounds. Ivy up stem. Contact wounds.
T49	Ash <i>Fraxinus excelsior</i>	Some restriction in growth due to surrounding trees. Ivy up stem.
T50	Ash <i>Fraxinus excelsior</i>	Some restriction in growth due to surrounding trees. Ivy up stem. Occasional dead limb.
T51	Sycamore <i>Acer pseudoplatanus</i>	Two stems from near base. Some restriction in growth due to surrounding trees. Weak joins. Ivy up stem.
T52	Sycamore <i>Acer pseudoplatanus</i>	Growing against wall. Weak joins. Occasional dead limb.
T53	Ash <i>Fraxinus excelsior</i>	Growing against wall. Weak joins. Occasional dead limb.
T54	Sycamore <i>Acer pseudoplatanus</i>	Two stems from about 2.5m. Ivy up stem. Weak joins. Some restriction in growth due to surrounding trees.
T55	Ash <i>Fraxinus excelsior</i>	Three stems from near base. One stem cut and left as stump. Dead limbs. Ivy up stem. Some bat roost potential.
T56	Holly <i>Ilex aquifolium</i>	Some restriction in growth due to surrounding trees. Occasional dead limb. Contact wounds. Holes in stem and uplifted bark. Some bat roost potential.
T57	Sycamore <i>Acer pseudoplatanus</i>	Three stems from near base. Some restriction in growth due to surrounding trees. Weak joins. Occasional dead limb.

T58	Sycamore <i>Acer pseudoplatanus</i>	Dense ivy up stem. Pruned in past with cuts healed/not healed. Some bat roost potential.
T59	Atlantic White Cedar <i>Chamaecyparis thyroides</i>	Some restriction in growth due to surrounding trees. Some die-back of lower limbs.
T60	Sycamore <i>Acer pseudoplatanus</i>	Good crown spread. Two stems from near base. Weak joins. Open wound in stem. Some bat roost potential.
T61	Yew <i>Taxus baccata</i>	Three stems. Overshadowed by T60. Dead limbs.
T62	Yew <i>Taxus baccata</i>	Overshadowed by T60. Dead limbs. Open wound in stem.
T63	Sycamore <i>Acer pseudoplatanus</i>	Three stems from near base. Leans towards south. Ivy up stem. Weak joins. Occasional dead limb. Occasional cracked off limb.
T64	Sycamore <i>Acer pseudoplatanus</i>	Two stems from near base, one stem from 0.5m, plus one stump. Some restriction in growth due to surrounding trees.
T65	Sycamore <i>Acer pseudoplatanus</i>	Three stems from about 1m with two more stems at 2m. Weak joins. Some restriction in growth due to surrounding trees. Occasional dead limb.
T66	Sycamore <i>Acer pseudoplatanus</i>	Two stems from near base plus one stump. Large open wound in base of stem. Some restriction in growth due to surrounding trees. Weak joins. Contact wounds.
T67	Sycamore <i>Acer pseudoplatanus</i>	Two stems from about 0.8m. Some restriction in growth due to surrounding trees. Weak joins.
T68	Yew <i>Taxus baccata</i>	Two stems from about 0.5m. Large open wound in stem. Pruned in past with cuts healed/not healed.
T69	Sycamore <i>Acer pseudoplatanus</i>	Growing out from wall – destabilising wall. Two stems from about 1.8m. Weak joins.
T70	Hazel <i>Corylus avellana</i>	Multi-stemmed. Large open wounds in stems.
71	Ash <i>Fraxinus excelsior</i>	Multi-stemmed. Outside of site boundary – likely to be in third-party ownership
Gp1		Group of about 15 trees (plus a number of trees under 150mm) forming part of an old defunct hedge-line – with Beech, Sycamore and Ash. Most two or more stems. Contact wounds and wounds in limbs/stems. Contact wounds.
Gp2		Line of seven Yews along eastern site boundary – part of defunct hedge-line. Single and double stemmed. Some die-back of lower limbs. Occasional open wound.
Gp3		Line of about 10 Yews (plus trees under 150mm) – part of defunct hedge. Single to multi-stemmed. Open wounds in

		stems/limbs.
5 TPO trees		Three Sycamores, one Beech and one Yew in southern section of site. Some bat roost potential.

10 APPENDIX FOUR: TREE CATEGORIES



11 APPENDIX FIVE: TREE RPA

