elliottconsultancyltd.
arboricultural consultants

Location:
Raby Castle,
(Underground Services)

Report Type:
Arboricultural Method Statement
inc. Impact Assessment

Ref:
ARB/CP/2585

Date:
August 2021

Wrens Nest, Underhill, Glaisdale, North Yorkshire, YO21 2PF
Tel – 01947 897001 Email: enquiries@elliottconsultancy.com
www.elliottconsultancy.com

Company Registration No: 5515572 VAT No: 89226571

Contents

Appendices

1 Introduction

1.1 This arboricultural method statement has been prepared by Charles Prowse of Elliott Consultancy Ltd at the request of the client. It will provide details regarding the retention and protection of trees during installation of the proposed underground services at Raby Castle. Trees within the castle gardens had previously been surveyed in 2019. To ensure continuity, the trees surveyed around the Gas House and north of the cricket ground use reference numbers that follow on from the 2019 survey. Some of the originally surveyed trees are affected by the underground services proposals so are included within the tree and group data (Appendix 2).

1.2 **Scope of the report:**

- This method statement provides arboricultural information and advice in relation to the proposed construction works at Raby Castle, as detailed within Appendix 4.
- It will outline any trees to be removed prior to development and those to be retained along with any pruning required. Also provided are details of all measures recommended for adequate tree protection including any special construction measures to be utilised.
- It should be used to guide the construction process in order to minimise potential damage to retained trees.
- It will detail, within the Arboricultural Tasks Sequence Table (Appendix 1), a timescale for implementation of these tree works and protective measures in reference to the development period.

1.3 **Prior to site works commencing, and in particular ground preparation, this Arboricultural Method Statement needs to passed to the site manager and used as reference during the development period, with particular attention paid Sections 5-7, and Appendices 1, 2, 4-8.**

2 Site Information

2.1 The area surveyed and the extent of which covered by this method statement is within the property of Raby Castle. Figure 1 shows the extent of the area.

Figure 1: **Area covered highlighted** (may alter from application boundary to account for adjacent trees)

Map data ©Google Imagery

2.2 The survey area is comprised of a deer park, managed gardens, and woodland surrounding numerous buildings with residential, commercial and operational uses.

2.3 The trees are located throughout the survey area and are found as individuals and within groups and woodland.

3 Tree Category Evaluation

3.1 The criteria used for evaluating how suitable each tree is for retention within a development is that suggested within 5837:2012.

3.2 BS5837:2012 notes that all trees apart from those with stem diameters <150mm or classified as Category U should be considered for retention and viewed as a potential site constraint. When inspected, each tree and or group feature is assigned one of four categories that signify how suitable that tree/group would be for retention within any development proposals, and therefore the degree to which it should constrain the site. The four categories are as follows:

3.2.1 **Category A** (coloured green) trees are those of high quality and value, and of a condition whereby they could make a substantial contribution to the site. The retention of Category A trees should be considered during the design phase and afforded adequate physical protection during the construction phase in accordance with BS 5837:2012 where retained. This means keeping proposed features and alterations to ground levels outside of root protection areas and crown spreads so as to ensure that the tree remains in an adequate condition post-development. Root protection areas and crown spreads are displayed upon the Tree Constraints Plan, Appendix 3. Twenty-eight individual trees and two groups of trees were classified as Category A.

3.2.2 **Category B** (coloured blue) trees are those of moderate quality and value, and of a condition that they make a substantial contribution to the site. The retention of Category B trees should be considered during the design phase and afforded adequate physical protection during the construction phase in accordance with BS 5837:2012 where retained. Thirty individual trees were classified as Category B.

3.2.3 **Category C** (coloured grey) trees are considered to be of low quality and value, but of an adequate condition to remain in the short-term. Trees with a stem diameter of less than 150mm (measured at 1.5m above ground level) are classified as Category C; these trees should also be retained where possible but where they form a significant constraint to development their removal should be permitted. Where they are to be retained they should be afforded adequate consideration during the design phase and physical protection during the construction phase in accordance with BS 5837:2012. Six individual trees and one group of trees were classified as Category C.

3.2.4 **Category U** (coloured red) trees are of such a condition that any existing value would be lost within 10 years. As a result it is recommended that Category U trees are not considered a constraint for development and are removed prior to construction commencing. None of the trees were classified as Category U.

3.2.5 In addition to the four main categories explained above, each tree/group is assigned a sub-category which signifies its overriding value as determined by the surveyor, which is noted by adding a suffix of 1, 2 or 3 alongside the category letter. 1 signifies that the trees/groups main value is arboricultural e.g. it may be a particularly good example or may be rare. 2 signifies that the overriding factor was due to the landscape value that the tree/group provides e.g. it may be part of a group feature such as a screen. 3 indicates that a cultural factor was the overriding value e.g. it may have historical or commemorative importance.

Summary of Categories Awarded			
Category	Tree Numbers	Group Numbers	Hedgerow Numbers
A	5, 6, 107-109, 111, 112, 114-121, 200-207, 209-211, 213, 214	15, 16	
B	4, 78, 99-101, 103-105, 182-199, 212, 215-217		
C	79, 102, 106, 110, 113, 208	17	
U			

4 Design Proposals Arboricultural Impact

4.1 This section concentrates on the proposed development and how it relates to the current tree population within the site. Any conflict issues between the proposed layout and existing trees are discussed and remedial options, where possible, suggested.

4.2 As displayed within Appendix 4 it is proposed that some new underground utilities will be installed and connected to infrastructure housed within existing and proposed buildings. A new substation building is also proposed to be constructed. Whilst the proposed infrastructure would be located within a number of root protection areas, including the route of the underground service trench, the intention is to retain the majority of the trees.

4.3 **Conflict 1: Loss of trees due to the proposed layout**

The construction of the proposed layout will necessitate the removal of one individual tree and a section of one group of trees.

Mitigation / Countermeasure: Tree 208 is a young Ash which was classified as Category C which would need to be removed to enable access to excavate the proposed trench for the underground services. A number of small trees, mostly Elder, would need to be removed from Group 17. The loss of the trees required will have a minor arboricultural impact.

4.4 **Conflict 2: Construction within close proximity to trees.**

There are some proposed structures within or close to root protection areas and crown spreads of trees.

Mitigation / Countermeasure: The route of the underground services trench coming in from Keverstone Bank and through the woodland west of the Gas House passes though root protection areas of 201, 202, 203, 204, 205, 206, 210, 216, 217 and Group 17. This route from the road was selected as is passes through an existing gate. The route through the woodland follows an existing ride with an obvious break in the upper canopy. The service trench will be open cut using either a mini-excavator or a combination of hand-digging and air-spade according to the areas indicated on the Tree Protection Plan (Appendix 4). The works required to install the trench through the woodland should be undertaken in accordance with Appendix 7 and NJUG (National Joint Utility Groups) guidelines in order to minimise damage to tree roots. The underground services continue west to the buildings around the

castle gardens and through the root protection areas of Trees 4 and 79, and then north from the substation through the root protection areas of Trees 104 and 109. A combination of open trench cut by either excavator or hand digging is also proposed for these sections. The proposed sub-station is located within the root protection areas of Trees 115 and 118. The loss of rooting area will be comparatively small, particularly for Tree 115 and provided that the surrounding ground is protected should not significantly detrimentally affect the trees. Finally, three garages are proposed to be constructed on the eastern side of Group 15. It is proposed that they will be sited upon no-dig cellular confinement system bases to avoid excavation within the root protection areas of the adjacent trees.

4.5 **Potential Conflict 3: Contractor access within Root Protection Areas**

Access by contractors will be required within root protection areas of Trees 4, 79, 115, 118, 201, 202, 203, 204, 205, 206, 207, 209, 210. Root protection areas of additional trees line the route but are already hard-surfaced.

Mitigation / Justification: Pedestrian access can be accounted for by installing ground protection that avoids damage to the roots and soil structure. A specification for ground protection is provided within Appendix 6 and should be installed within the areas indicated upon Appendix 4.

4.6 **Potential Conflict 4: Damage to trees within site during demolition and construction.**

Trees may be damaged due to a variety of reasons during a demolition and development process.

Mitigation / Countermeasure: A physical demarcation will be created between the retained trees and demolition/development areas to ensure that the trees and the medium within which they are rooting are protected from damage. The actual method of creating the demarcation might vary, where appropriate, but will typically be a physical barrier. The location for the barrier is detailed upon Appendix 4 with a specification within Appendix 5.

4.7 **Potential Conflict 5: Pruning trees to create clearance to structures.**

Trees overhanging working areas and proposed buildings will need to be pruned to facilitate works.

Mitigation / Countermeasure: Pruning operations will be limited to crown lifting of the trees over the proposed substation and working areas. All pruning operations would be undertaken in accordance with BS 3998:2010 Tree work,

Recommendations and are specified within Appendix 2.

4.8 **Potential Conflict 6: Damage to structures from trees.**

Trees are capable causing damage to structures either directly, such as physical contact damage or indirectly given the right conditions, such as subsidence.

Mitigation / Countermeasure: Chapter 4.2 'Building near Trees' of the NHBC Standards should be consulted by those responsible regarding building foundation depths required according to the species of adjacent trees, and for suitable species to be planted given their intended positions to new and existing structures.

5 Pre-Development and Site Preparation Works

5.1 Refer to Appendix 1 for stage specific tasks.

5.2 Prior to any site works commencing, the following arboricultural specific actions need to be implemented:

a) An arboricultural contractor should be sought and the tree works recommended within Appendix 2 undertaken.

b) A supplier needs to be sought to provide the tree protection features as agreed with the Local Planning Authority.

5.3 Once the aforementioned tasks have been completed and prior to any site work the tree protection barriers need to be erected as per the Tree Protection Plan (Appendix 4). The barrier must encompass the root protection areas and crown extents of the retained trees to ensure that these areas remain free from disturbance.

5.3.1 The barriers needs to be installed according to the locations found on the Tree Protection Plan, Appendix 4 and conform to the specification within Appendix 5, Type B (if approved by the Local Planning Authority). All weather notices should be attached to the fencing marked with the following: '*Construction Exclusion Zone - Keep Out'* (a notice is provided within Appendix 8).

5.3.2 The ground protection needs to be installed in the areas noted upon Appendix 4 and conform to the specification within Appendix 6.

5.3.3 The project arboriculturalist or Local Authority Tree Officer should check the correct installation of the protective features prior to any site works commencing.

5.4 Material storage must be confined to areas outside root protection areas.

5.5 A copy of the Tree Protection Plan must be available on site.

5.6 Activities that could be harmful to root tissue (e.g. excavation, mixing of and washing out toxic substances such as cement) should be avoided in close proximity to trees.

6 Tree protection measures during development

6.1 Refer to Appendix 1 for stage specific tasks.

6.2 All ground levels where trees are located should be maintained. Changes to soil levels adjacent to trees can severely affect the trees structural integrity and its ability to gain moisture and nutrients from the surrounding soil. Unavoidable level changes that may affect retained trees, and not already accounted for within this method statement, should be assessed by the project arboriculturalist.

6.3 Building material storage and operations that can contaminate soil, such as cement mixing, must be confined to areas outside the root protection areas, which includes the new parking area once created.

6.4 Fires should not be lit within 5m of the foliage or drip line of the tree. Care should be taken and the fire should not be allowed to become large, and the wind direction noted.

6.5 The trees should not be used to attach notices, cables or other services.

6.6 The installation of any underground services near or adjacent to trees on the site shall conform to the requirements of National Joint Utilities Group (NJUG) publication Volume 4 (November 2007). If relevant, the intended service routes will be noted upon the Tree Protection Plan, Appendix 4. Additional information regarding excavations within root protection areas are provided within Appendix 6.

6.7 At the beginning of the construction phase, the site manager will appoint a delegated site representative who shall be responsible for continued checking of the protective barriers to ensure it is compliant with the exclusion zone. Appendix 9 contains a record sheet that can be copied for such use.

6.8 As recommended within BS 5837:2012, and specified within the Arboricultural Tasks Sequence Table, the development site should be visited by the project arboriculturalist on occasions to provide any arboricultural advice necessary and to ensure the efficacy of the Tree Protection features. Contact between the project manager and project arboriculturalist should be maintained throughout the works period so that supervision can be provided when operations with the potential to damage retained trees are being undertaken. Key stages that will require the attendance of a qualified arboriculturalist with evidence of the visit provided to LPA are:

- Inspection of tree protection features prior to site works commencing.

- Unarranged spot check(s) carried out during the course of the build.
- Supervision of construction activities that could lead to damage of retained trees.
- Site visit to ensure all development operations have been completed prior to tree protection features being removed and to inspect the condition of the trees.

7 Post-Construction Considerations

7.1 Refer to Appendix 1 for stage specific tasks.

7.2 Only once all major construction works have been completed can the protective barriers be removed.

7.3 Post development landscaping should be kept to a minimum within the root protection areas of retained trees.

7.4 Since trees are capable of influencing soil hydrology newly planted trees need to be situated where they will not interfere with built structures. Refer to NHBC Chapter 4.2 'Building near Trees' and Arboriculture Research and Information Note 'Tree Roots and Foundations' for further information.

Appendix 1: Arboricultural Tasks Sequence Table

Tree or Group Number	Pre-Construction Stage	Construction Stage	Post Construction Stage
Tree 208 Section of Group 17 indicated red on Appendix 4	Remove		
Trees 4, 79, 115, 118, 198, 199, 201-207, 209-217 Group 15, 16 Remaining section of Group 17	Adhere to specification within Section 5. Set out and erect protective fencing as per Appendices 4 and 5. Attach notice in Appendix 8. Install ground protection as per Appendices 4 and 6. Project arboriculturalist should check the correct installation of protective features prior to site works commencing.	Adhere to specification within Section 6. Monitor integrity of tree protection features daily; completing inspection record in Appendix 9.	Adhere to specification within Section 7. Remove tree protection measures. Complete landscape works adjacent to trees.

Appendix 2: Tree Data & Works Required

Key for Tree & Group Data tables:

No.	Tree Number
Species	Tree Name (common)
Age	Y = Young; SM = Semi-mature; EM = Early-mature M = Mature; OM = Over-mature; V = Veteran; D = Dead
DBH	Diameter at Breast Height (measured at 1.5m above ground level to the nearest cm)
Stems	The number of stems the tree has
Height	Overall tree height measured in metres
Crown Spread	Measured along the four cardinal points in metres
CH	Canopy Height (height of crown above ground)
1st Branch	The height and aspect of the 1st significant limb e.g. 2 NE = 1st limb at 2m growing in a north-easterly direction.
EstD	Indication of whether any of the trees dimensions were estimated: Y=Yes, N=No.
General Observations	Appraisal of trees general condition
EstCont	Estimated remaining contribution (years)
BS Cat	British Standard 5837:2012 retention category
Recommendation	Remedial works that may be required should the tree be retained

Tree Survey Data

No.	Species	Age	DBH	Stems	Height	Crown Spread				CH	EstD	General Observations	EstCont	BS Cat	Recommendation
						N	S	E	W						
4	Cherry spp	M	62	1	12	8	10	7	8	1.5	N	Ivy covered stem & crown - severed. Pruning wounds upon stem.	20+	B1	Crown lift northern part of canopy to 2.5m over route of excavation
5	Sycamore	M	106	1	23	7	8	7	9	2	N	Pruning wounds within crown. Continuous canopy with adjacent tree(s). Minor deadwood.	40+	A2	No work required
6	Sycamore	M	117	1	24	9	7	10	8	2	N	Pruning wounds within crown. Continuous canopy with adjacent tree(s). Minor deadwood. Previous limb losses. Cavity of unknown extent in southeast facing lower limb.	40+	A2	No work required
78	Yew	SM	42	5+	7	2	2	2	2	0	N	Multi-stemmed at base.	40+	B1	No work required
79	False Acacia	EM	47	2-5	7	5	3	3	3	1.5	N	Multi-stemmed at base. Branch failure stubs. Minor crown dieback. Minor deadwood.	20+	C1	Monitor physiological condition.
99	Sycamore	SM	48	1	14	5	7	6	6	2	N	Stem leaning 15 degrees. Continuous canopy with adjacent tree(s).	40+	B2	No work required
100	Larch spp	M	47	1	14	3	4	3	2	1.5	N	Ivy covered stem & crown limited the inspection. Continuous canopy with adjacent tree(s). Branch failure stubs. Minor deadwood.	40+	B2	No work required

No.	Species	Age	DBH	Stems	Height	Crown Spread				CH	EstD	General Observations	EstCont	BS Cat	Recommendation
						N	S	E	W						
101	Larch spp	M	38	1	16	5	5	4	7	1.5	N	Ivy covered stem. Branch failure stubs. Minor deadwood. Continuous canopy with adjacent tree(s).	40+	B2	No work required
102	Beech	Y	22	1	9	2	6	3	2	0.5	N	Slightly suppressed form. Continuous canopy with adjacent tree(s).	40+	C2	No work required
103	Beech	Y	32	1	12	3	7	3	3	0.5	N	Continuous canopy with adjacent tree(s).	40+	B2	No work required
104	Beech	SM	52	1	14	6	8	6	4	0.5	N	Ivy covered stem. Minor deadwood. Continuous canopy with adjacent tree(s).	40+	B1	No work required
105	Beech	SM	46	1	9	9	6	7	6	0.5	N	Apical dominance lost at 4m. Minor deadwood. Continuous canopy with adjacent tree(s).	40+	B2	No work required
106	Sycamore	M	62	1	14	13	0.5	7	7	1.5	N	Basal wound with rhizomorphs of Honey Fungus present but not obviously infecting. Present. Stem leaning 15 degrees. Suppressed form. Minor deadwood. Continuous canopy with adjacent tree(s).	10+	C2	Monitor for symptoms of Honey Fungus infection
107	Sycamore	M	64	1	26	7	6	8	5	2	N	Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	No work required
108	Beech	M	70	1	26	8	9	5	5	4	N	Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	No work required
109	Sycamore	M	74	1	26	8	6	5	8	4	N	Roots displacing low wall. Pruning wounds upon stem. Minor deadwood. Continuous canopy with adjacent tree(s). Minor crown dieback.	40+	A2	No work required

No.	Species	Age	DBH	Stems	Height	Crown Spread				CH	EstD	General Observations	EstCont	BS Cat	Recommendation
						N	S	E	W						
110	Sycamore	EM	51	1	19	3	6	6	3	2	N	Codominant stems at 4.5m - apical dominance lost from both stems at approx 9m. Minor deadwood.	20+	C2	No work required
111	Sycamore	M	62	1	26	5	6	4	8	3	N	Pruning wounds upon stem. Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	No work required
112	Sycamore	M	76	1	25	5	6	6	8	3	N	Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	No work required
113	Sycamore	M	85	1	21	9	8	6	8	2	N	Extensive basal cavity open from base to 2m. Branch failure tear wound within upper crown on main stem. Longitudinal crack through stem from 4.5m-8m. Minor deadwood. Continuous canopy with adjacent tree(s).	10+	C2	Undertake structural investigation of various faults.
114	Common Oak	EM	69	1	26	7	4	8	5	8	N	Epicormic growth upon stem. Branch failure stubs. Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	No work required
115	Common Oak	EM	77	1	27	5	9	5	7	1.5	N	Occluding wounds on mid-stem. Epicormic growth upon stem and in crown. Branch failure stubs. Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	Crown lift southern part of canopy to clear roof of proposed sub-station by 1m
116	Beech	EM	57	1	18	8	6	9	6	1.5	N	Damage to surface roots. Minor deadwood. Slightly suppressed form. Continuous canopy with adjacent tree(s).	40+	A2	No work required

No.	Species	Age	DBH	Stems	Height	Crown Spread				CH	EstD	General Observations	EstCont	BS Cat	Recommendation
						N	S	E	W						
117	Common Oak	EM	53	1	26	5	7	5	5	7	N	Epicormic growth upon stem. Branch failure stubs. Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	No work required
118	Beech	M	106	1	27	4	9	7	9	0	N	Codominant stems with included bark union(s) at 4.5m - stems remain in contact until 8m. Branch failure stubs. Minor deadwood. Continuous canopy with adjacent tree(s). Crown encroaching building.	20+	A2	Crown lift western part of canopy to clear roof of proposed sub-station by 1m
119	Sycamore	EM	65	1	26	8	8	5	6	2	N	Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	No work required
120	Beech	M	75	1	28	8	8	4	7	2.5	N	Crown encroaching building. Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	Prune to clear building.
121	Beech	EM	129	1	29	9	10	13	6	0	N	Surface roots. Crown encroaching building. Branch failure stubs. Minor deadwood. Continuous canopy with adjacent tree(s).	40+	A2	Prune to clear building.
182	Lime spp	SM	35	1	9	4	4	3	5	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
183	Lime spp	SM	38	1	9	5	5	3	3	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
184	Lime spp	SM	35	1	10	5	5	3	3	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required

No.	Species	Age	DBH	Stems	Height	Crown Spread				CH	EstD	General Observations	EstCont	BS Cat	Recommendation
						N	S	E	W						
185	Lime spp	SM	39	1	12	5	5	3	3	2	N	Within guard. Included bark unions present. Codominant stems at 3.5m. Part of line north of cricket pitch.	40+	B2	No work required
186	Lime spp	SM	41	1	10	5	5	3	3	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
187	Lime spp	SM	44	1	8	5	5	3	3	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
188	Lime spp	SM	42	1	8	5	5	3	3	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
189	Lime spp	SM	36	1	9	6	5	3	3	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
190	Lime spp	SM	42	1	10	6	5	3	3	2	N	Within guard. Included bark unions present. Codominant stems at 2.5m. Part of line north of cricket pitch.	40+	B2	No work required
191	Lime spp	SM	31	1	8	6	4	3	3	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
192	Lime spp	SM	34	1	6	6	4	3	3	2	N	Within guard. Included bark unions present. Apical stem lost at 3m. Part of line north of cricket pitch.	40+	B2	No work required
193	Lime spp	SM	33	1	7	6	4	3	3	2	N	Within guard. Included bark unions present. Codominant stems at 2m. Part of line north of cricket pitch.	40+	B2	No work required

No.	Species	Age	DBH	Stems	Height	Crown Spread				CH	EstD	General Observations	EstCont	BS Cat	Recommendation
						N	S	E	W						
194	Lime spp	SM	46	1	8	6	5	3	4	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
195	Lime spp	SM	33	1	8	5	5	3	4	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
196	Lime spp	SM	32	1	9	6	5	3	4	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
197	Lime spp	SM	35	1	10	6	4	3	4	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
198	Lime spp	SM	37	1	9	5	4	3	3	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
199	Lime spp	SM	47	1	9	5	4	5	3	2	N	Within guard. Included bark unions present. Part of line north of cricket pitch.	40+	B2	No work required
200	Sycamore	M	136	1	20	13	9	11	8	6	N	Codominant stems at 6m. Pruning wounds within crown. Minor deadwood.	40+	A1	No work required
201	Sycamore	M	53	1	18	4	5	3	6	2.5	N	Ivy covered stem. Part of woodland, forms part of high canopy. Minor deadwood.	40+	A2	No work required
202	Common Oak	M	52	1	18	4	4	2	6	2	N	Part of woodland, forms part of high canopy. Minor deadwood. Slightly suppressed form.	40+	A2	No work required
203	Sycamore	M	53	1	20	5	7	7	5	2	N	Part of woodland, forms part of high canopy. Minor deadwood.	40+	A2	No work required

No.	Species	Age	DBH	Stems	Height	Crown Spread				CH	EstD	General Observations	EstCont	BS Cat	Recommendation
						N	S	E	W						
204	Sycamore	M	50	1	19	4	5	3	6	2.5	N	Ivy covered stem. Epicormic growth at base. Part of woodland, forms part of high canopy. Branch failure stubs Minor deadwood.	40+	A2	No work required
205	Ash	M	78	1	23	8	11	9	14	10	N	Part of woodland, forms part of high canopy. Occluded stem wound. Codominant stems at 5m. Minor deadwood.	40+	A2	No work required
206	Horse Chestnut	M	63	1	17	6	3	5	6	0.5	N	Part of woodland, forms part of high canopy.	40+	A2	No work required
207	Sycamore	M	52	1	19	8	4	4	7	2.5	N	Part of woodland, forms part of high canopy. Branch failure stubs Minor deadwood.	40+	A2	No work required
208	Ash	Y	12	2-5	8.5	3	2	2	2	2	N	Codominant stems.	40+	C1	Remove tree
209	Beech	M	63	1	22	6	5	5	6	2.5	N	Part of woodland, forms part of high canopy. Minor deadwood.	40+	A2	No work required
210	Sycamore	M	54	1	19	5	6	6	5	2.5	N	Part of woodland, forms part of high canopy. Minor deadwood.	40+	A2	No work required
211	Beech	EM	36	1	19	5	4	5	4	0.5	N	Part of woodland, forms part of high canopy. Minor deadwood.	40+	A2	No work required
212	Beech	EM	46	1	19	5	4	5	4	0.5	N	Part of woodland, forms part of high canopy. Codominant stems with included bark unions at 4m. Minor deadwood.	40+	B2	No work required

No.	Species	Age	DBH	Stems	Height	Crown Spread				CH	EstD	General Observations	EstCont	BS Cat	Recommendation
						N	S	E	W						
213	Ash	EM	52	1	21	8	7	6	9	0.5	N	Part of woodland, forms part of high canopy. Minor deadwood.	40+	A2	No work required
214	Beech	EM	80	1	21	9	6	7	7	0.5	N	Part of woodland, forms part of high canopy. Ivy covered stem. Minor deadwood.	40+	A2	No work required
215	Holly	M	23	1	13	3	2	2	2	0	N	Slightly suppressed form.	40+	B1	No work required
216	Yew	M	75	1	9	6	4	7	4	0.5	N	Multi-stemmed.	40+	B1	Crown lift southern part of canopy to 2.5m over route of excavation
217	Ash	EM	56	1	18	9	6	8	7	2.5	N	Branch failure stubs. High pruned.	40+	B1	No work required

Group Data

Group Number	Dominant Species	Lesser Species	DBH	Average Height	Age	Average Spread	Condition/Comments	Recommendations	EstCont	BS Cat
15	Beech Ash Common Oak Hawthorn	Sycamore Elm spp Elder Holly	60	18	Y-M	6	Section of woodland south of ride. Generally typified by high, closed canopy with dense shrub layer. Varied health and form. Small number of dead/in decline trees. Minor deadwood. Branch failure stubs.	No work required	40+	A2
16	Beech Ash Common Oak Hawthorn	Sycamore Holly Elder	60	18	Y-M	6	Section of woodland north of ride. Generally typified by high, closed canopy with dense shrub layer. Varied health and form. Small number of dead/in decline trees. Minor deadwood. Branch failure stubs.	No work required	40+	A2
17	Elder	Hawthorn Holly	10	2.5	SM	1.5	Group within ride comprised primarily of Elder.	Remove trees in area indicated red on Appendix 4	40+	C2

elliottconsultancyltd.
arboricultural consultants

Wrens Nest, Underhill, Glaisdale
North Yorkshire YO21 2PF
01947 897001
enquiries@elliotconsultancy.com

Tree Position Showing Crown Extents and BS5837 Category A

Tree Position Showing Crown Extents and BS5837 Category B

Tree Position Showing Crown Extents and BS5837 Category C

Tree Position Showing Crown Extents and BS5837 Category U

Root Protection Area - to remain free from disturbance

Group of Trees

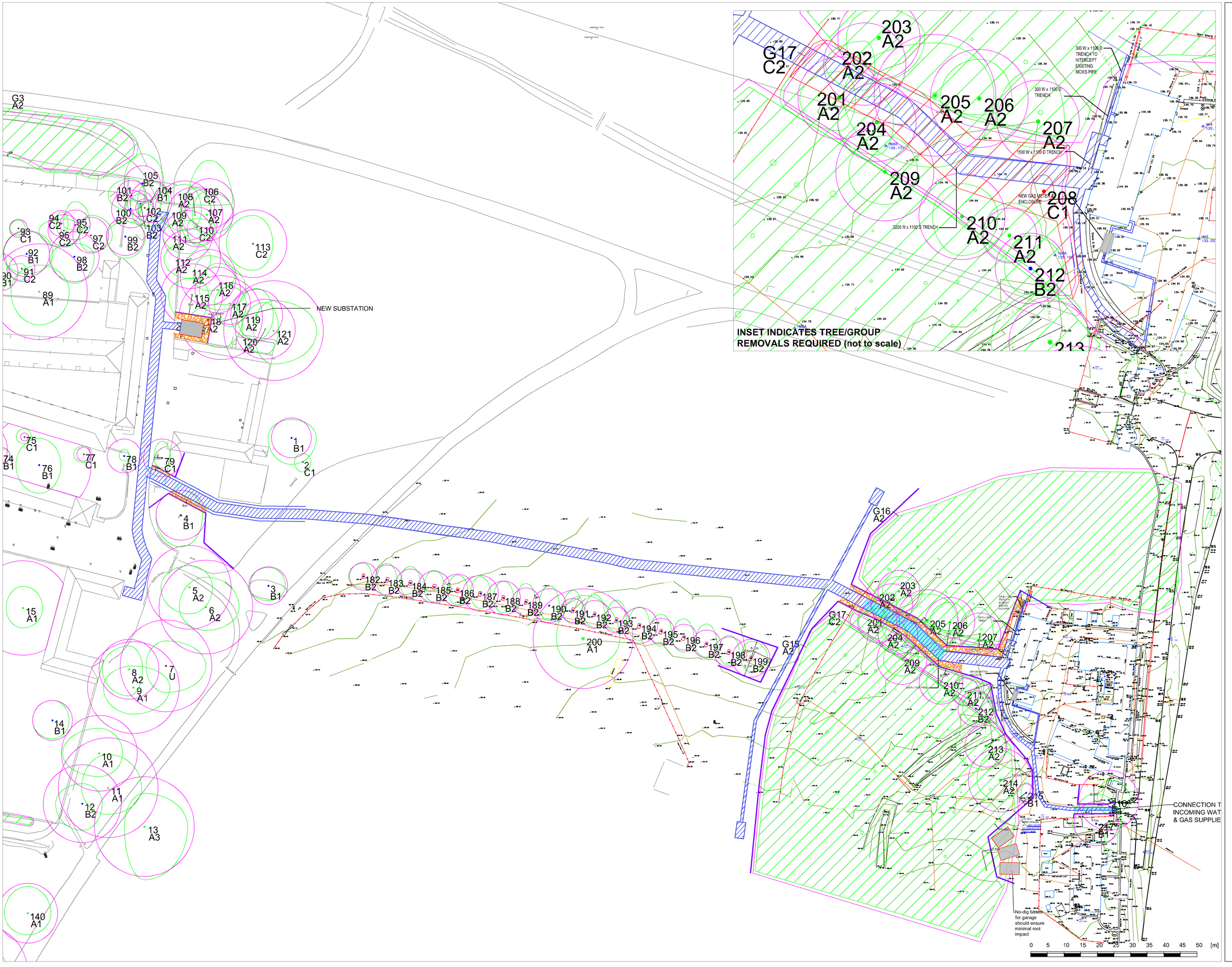
1/G1 Tree/Group Number

A1/B1/C1/U BS5837 Retention Category

1 Photo Number, Position and Aspect

APPENDIX 3

Drawing Title:	Tree Constraints Plan
Project:	Raby Castle Underground Services
Drawing Number:	ARB/CP/2585/TCP
Date:	June 2021
Scale:	1:500 @ A1



elliottconsultancyltd.
arboricultural consultants

Wrens Nest, Underhill, Glaisdale
North Yorkshire YO21 2PF
01947 897001
enquiries@elliottconsultancy.com

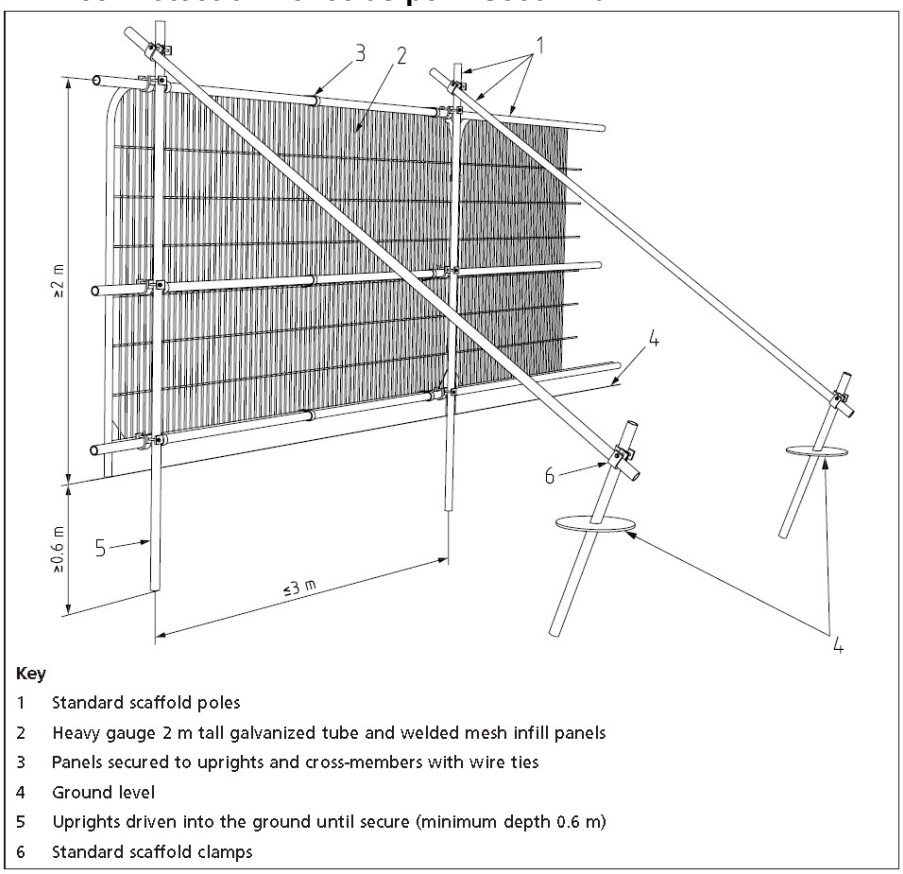
- Tree to be Retained
- Tree to te Removed
- Root Prctection Area - to remair free from disturbance
- Group o' Trees to be Retained
- Group o' Trees to be Removed
- Tree Prctection Barrier (specification as per Appendix 5, Type B)
- Minimum Area to be Hand-Dug Air Spade (works in accordance with Appendix 7)
- Ground Protection (specificatior as per Appendix 6)
- 1/G1 Tree/Grcup Number
- A1/B1/ C1/U BS5837 Retention Category

APPENDIX 4

Drawing Title:	Tree Protection Plan
Project:	Raby Castle Undeground Services
Drawing Number:	ARB/CP/2565/TPP
Date:	August 2021
Scale:	1:500 @ A1

Appendix 5: Protective Fencing Specification

A:- Tree Protection Fence as per BS5837:2012



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

Drawing Source: BS 5837:2012

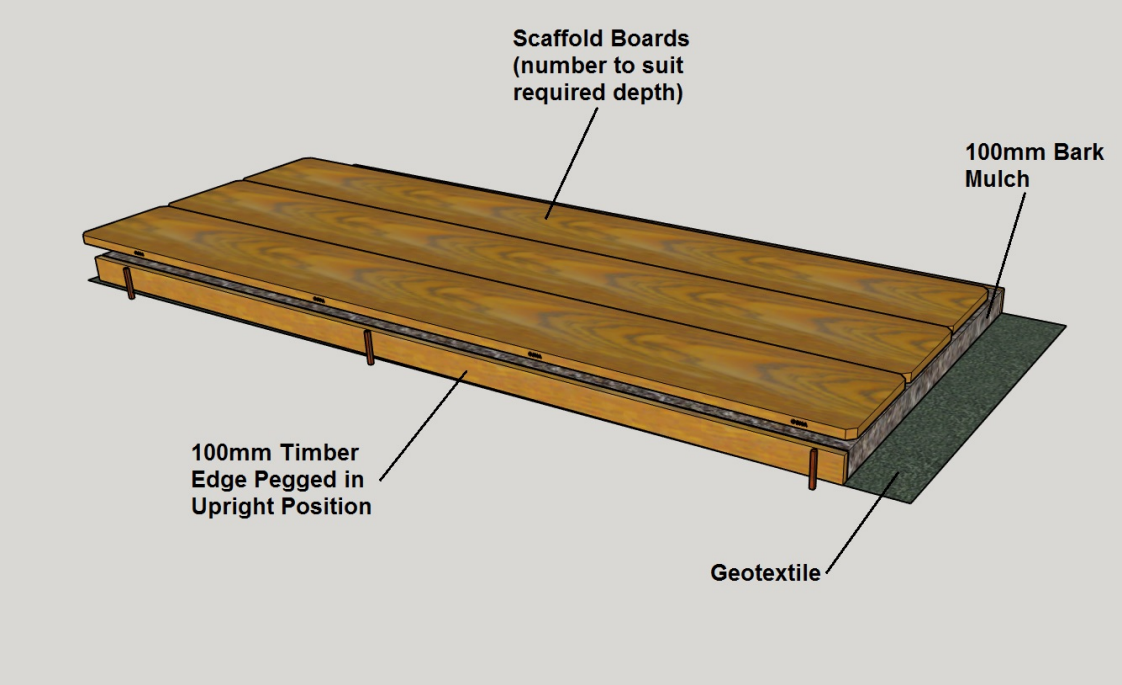
B:- Alternative Fencing Detail: Adequate protection - provided LPA approve its use

Weldmesh fence panels attached together using fence couplers bolted to 100mmx100mmx2400mm treated timber fence posts driven 500mm into the ground. Use of plant to assist with erection only from outside of root protection area.

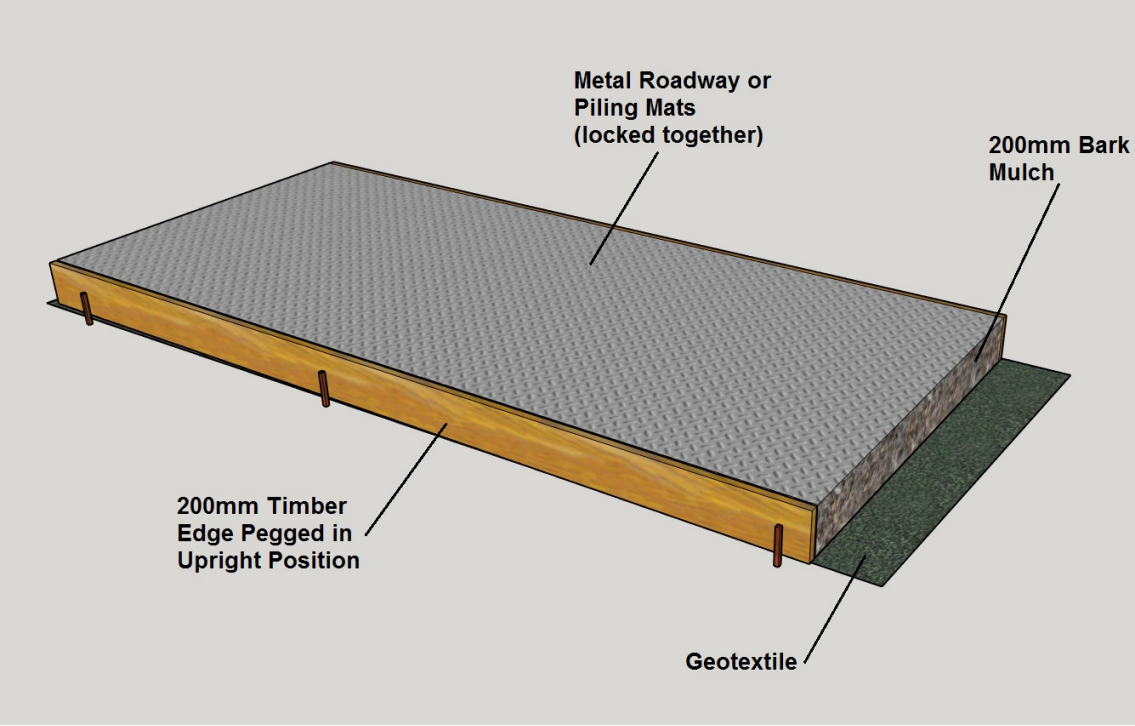
Appendix 6: Access within Root Protection Areas

Ground Protection to Enable Access within Root Protection Areas

For Pedestrians Only



Suitable for Light Traffic & Plant

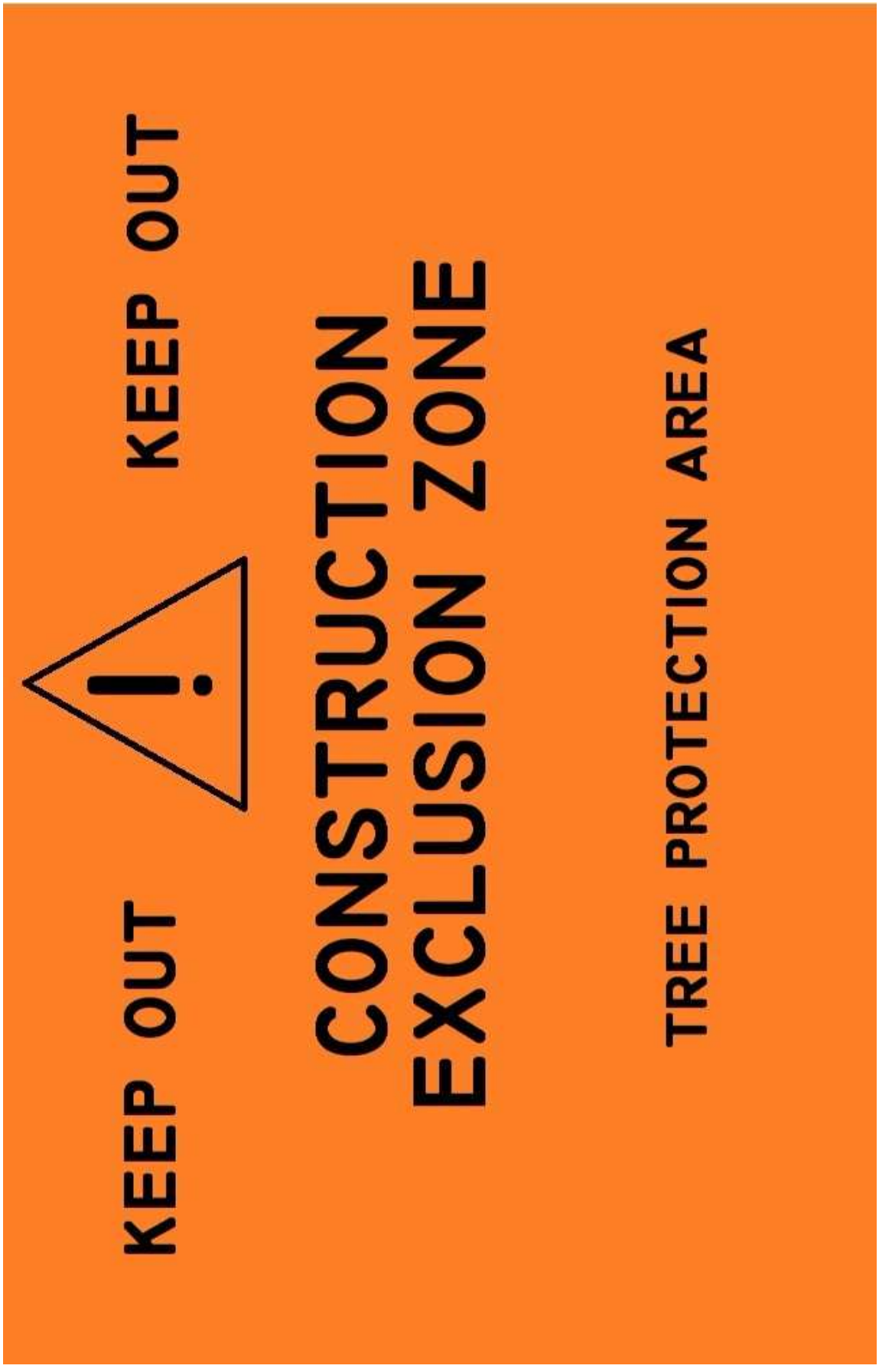


Where erecting scaffolding within areas of protected ground. The geotextile should be laid and then the scaffold footings placed on boards to spread the load. Ground protection as above should then be installed if access beneath the scaffolding is required.

Appendix 7: Removing Hard Surfaces & Other Excavations within Root Protection Areas

- All excavations within root protections areas must only be undertaken using hand tools or pedestrian operated machinery.
- The required excavations must be kept to a minimum to avoid unnecessary root damage and ideally undertaken during the presence of an arboriculturalist.
- Great care must be taken not to damage the bark of roots that can be retained in order to avoid wounds which could be exploited by pathogens.
- Exposed roots that can be retained must be wrapped with dry sacking if to be left exposed for extended periods e.g. overnight. Sacking must be removed prior to backfilling.
- All roots >25mm should be preserved and worked around. Where this is not possible, severance should only take place after consultation with the tree officer / appointed arboriculturalist. Roots must be cut using a sharp knife leaving as small a wound and as clean a cut as possible.
- Great care must be taken not to allow contaminants, such as oils, into the excavation.

Appendix 8: Construction Exclusion Zone Notice



Appendix 9: Tree Protection Zones Inspection Record

Tree Protection Zones Inspection Record – assessment of tree protection barriers and ground protection			
Date	**Checked By**	**Comments**	**Action Required?**

Appendix 10: Contact Details of Relevant Parties

Arboricultural Consultant	Charles Prowse Elliott Consultancy Ltd Wren's Nest Underhill Glaisdale YO212PF 01947 897001 07810200968 charles@elliottconsultancy.com
Local Planning Authority	Regeneration and Local Services County Hall Durham DH1 5UQ 03000 262830 planning@durham.gov.uk