ARBORICULTURAL IMPACT ASSESSMENT
AT PENSTHORPE NATURAL PARK, PENSTHORPE ROAD, FAKENHAM

Prepared for Pensthorpe Natural Park

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TREE SURVEYS

Executive Summary

This assessment outlines the tree constraints that affect the construction of new bridge crossings, raised walkway, viewing platforms and pavilions and demonstrates how the retained trees can be protected throughout the development process.

Eight of the trees will need to be removed for development purposes. However, the tree losses will be replaced with remedial planting designed to be in keeping with the new development and provide landscape benefits and new wildlife habitats.

All the retained trees will be provided with proper protection as set out in BS5837:2012 during the construction phase. Protection measures will include erecting temporary protective fencing, temporary ground protection and the careful excavation of post holes as appropriate.

This assessment forms an important stage in the process of managing and protecting the trees on site in relation to the proposed development. However, it will only ensure the protection of the trees on site if the tree protection measures in the Arboricultural Method Statement are implemented in full and the prescribed system of arboricultural supervision is followed. Tree protection works must be fully integrated into the construction process.

Works will need to be carried out carefully and adhering to the tree protection measures throughout the construction process in order to minimise the impact to retained trees.

G.G. Robbie
AT Coombes Associates Ltd.
19 December 2023

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1. Terms of Reference

1.1 The aim of this assessment is to survey trees that may be affected by the construction of new bridges and boardwalks at Pensthorpe Natural Park.

1.2 The assessment addresses the likely impact of the proposed development on surrounding trees and provides recommendations for the protection of retained trees during construction work based on BS 5837:2012 “Trees in relation to design, demolition and construction-Recommendations”.

1.3 The client has provided a topographical survey showing the accurate position of all trees and features on site. Also provided was the proposed layout for the development. These plans have been used to form the basis of the Tree Constraints Plan (TCP, Appendix 3) and Tree Protection Plan (TPP, Appendix 4). A number of the trees within G1 and areas of scrub vegetation were not identified on the topographical survey, and therefore they have been added to the TCP using measurements and / or observations made on site. These positions must be checked on site prior to construction.

1.4 This assessment is an update of the previous Preliminary Arboricultural Impact Assessment for the site produced to advise the design process.

2. Site Description

2.1 Pensthorpe Natural Park is a nature reserve and attraction in north Norfolk, southeast of Fakenham. The landscape is predominately agricultural with the river Wensum meandering through, with pockets of woodland. The site stretches across Pointers Lake and includes one of the islands. It contains a mixture of trees from juvenile to over mature, which border the lake and have established on the island.

Fig 1: View of island from the east

Fig 2: View of island from the north

3. Tree Survey Details

3.1 Appendix 1, the Tree Survey Schedule gives the survey findings in tabular form. The schedule contains all the information specified in section 4.4.2.5 of the British Standard. Appendix 2 gives a full explanation of the survey headings.

3.2 The trees were surveyed on 29 September 2023; they were not climbed, but surveyed from ground level.

3.3 The details recorded during the tree survey have been collected independently of any development proposals, and the categorisation of the quality and amenity value of the trees is made purely on arboricultural grounds.

3.4 No assessment of the soil has taken place as part of this report. The British Standard states that a soil assessment should be carried out by a competent person to establish the structure, clay content and potential for volume change of the soil. A survey of this nature is considered outside the scope of this Arboricultural Assessment. For guidance on soil structure in relation to construction advice should be sought from a Structural Engineer. Guidance on foundation depth in relation to building and trees can be found in NHBC Chapter 4.2.

4. Assessment of Tree Constraints

4.1 To facilitate the proper assessment of tree constraints a Tree Constraints Plan (TCP) has been prepared and forms Appendix 3. The plan has been produced as a basis for the assessment of the constraints imposed by existing trees on the proposed design.

4.2 Appendix 3 shows the position of trees marked by a coloured dot matching the retention category status and a reference number (as listed in Appendix 1). Heights (Ht) are marked in metres for each tree, together with the predicted ultimate heights (U/Hgt).

4.3 The plan deals with constraints that the trees may place on the development in two areas as follows:

Below ground Constraints

4.4 The Root Protection Areas (RPA) for the trees are shown as a coloured circle to match the retention category colour. The RPA will be used to help inform the closest positions of any future buildings. The RPA will be protected during any development work with temporary barriers as prescribed by the British Standard.

Above Ground Constraints

4.5 The branch spreads were measured at the four cardinal compass points, with a shape drawn around these points to indicate approximate branch spread, represented by green broken lines on the plan. The ultimate crown spread has been shown with an orange dashed line. This is a predicted distance, and is based on personal experience of how far it is likely the crown will grow.

4.6 Shade patterns have not been shown on this plan as they are not relevant to this development.

5. Arboricultural Impact Assessment

5.1 A total of seventeen individual trees and six tree groups were included in this report. Groups contain trees forming continuous features or clusters with similar characteristics.

5.2 Nine trees (T1, T3-5, T7, T8, T13, T16 & T17) and three tree groups (G1, G4 & G5) have been classed as Category B. These trees are generally in good condition and confer landscape values. They should be retained where possible in the context of a development.

5.3 Seven individual trees (T2, T6, T9-12 & T15) and two groups (G2 & G6) have been classified as Category C. These trees are small or in poorer condition and do not play such a significant role in the local landscape. C category trees are usually of such a quality that the Local Authority may consider it acceptable for them to be removed for development purposes, if required.

5.4 One tree (T14) and one tree group (G3) have been categorised as U category trees in poor condition and unlikely to provide a landscape contribution for more than 10 years these trees will be removed on arboricultural grounds regardless of the progress of the development.

5.5 Any trees that are retained will be provided with their proper protection according to BS5837:2012 regardless of which category they have been placed in.

5.6 The project consists of a series of ramps, platforms, boardwalks and bridges that will cross Pointers Lake in two places, with pavilions set out along the route. The tree constraints for each element of the development, are considered separately below:

Element	**Detail**
Construction of Platform One	Platform 1 and the associated wheelchair accessible ramps will be situated outside the RPA and branch spreads of all trees included within this survey.
Construction of Bridge Crossing One	Bridge Crossing One is a wheelchair accessible suspended rope bridge. The rope bridge support frame and ground anchors will all be outside the constraints posed by trees present on site.
Construction of Platforms Two to Six and Raised Walkway	A raised walkway will be constructed on the island, with a number of platforms along the route. The proposed walkway will require the removal of two B category trees within G1, and the C category tree T2. It may also be necessary to remove smaller scrubby vegetation that is too small to be included within the tree survey. These trees should be replaced as set out in section 6 below. Support posts for the walkway will be put in place within the RPA of retained trees, including those in G1, T1, T2, T3 and T4. To ensure that the trees are not damaged when putting the fencing in place, the post holes for the walkway will be excavated using an airspade or hand tools. If roots over 50mm diameter are found the position of the hole will be adjusted to avoid them. If roots under this diameter are found they will be pruned to the edge of the hole using a sharp handsaw or secateurs. This work should be carried out under arboricultural supervision. The holes will then be lined with a rootbarrier material to prevent the leaching of any phytotoxic material from the wet concrete. Particular care must be exercised when installing the walkway as the platforms will be installed in close proximity to the stems of T1 and T4.

Element	Detail
Construction of Platforms Two to Six and Raised Walkway cont.	The platforms will also be within the branch spreads of T1, T3, T4 and G1. The amount of facilitative crown pruning will be agreed and carried out prior to the commencement of construction works by suitably qualified and experienced arborists. The branches on these trees, in many instances, reach down to ground level so it is anticipated that it may be necessary to remove some large branches in order to construct the walkway.
Construction of Pavilions and Lookout Platforms	Pavilions and lookout platforms will be put in place along the proposed walkway. Whilst these will not have any additional below ground impacts on the adjacent trees, it is likely that additional facilitative crown pruning will be required both to provide the additional clearance needed and also to allow for views from the lookouts that may otherwise be blocked by trees and scrub. The facilitative crown pruning will be agreed and carried out prior to the commencement of construction works by suitably qualified and experienced arborists.
Construction of Bridge Crossing Two	Bridge crossing two will be constructed to provide access to the south of the island. Platform six, the rope bridge support frame and ground anchors for bridge crossing two will be within the RPA of the B category trees T3 and T4. Therefore, careful excavation as outlined above will be carried out to minimise the impact to these trees. At the southern end of Bridge Crossing Two, it will be necessary to remove the B category tree T7, as well as C category trees T9 and the two within group G2. These trees will be removed and replaced as set out in section 6 below. The proposed ground anchors for the bridge are also within 1.5m of the stem of the B category oak T8. If the ground anchors are to be positioned here, it is unlikely that it will be possible to carry out the necessary excavation whilst still retaining the tree. This tree will therefore have to be removed and replaced as set out in section 6 below. The rope bridge and its support frame will be within the branch spread of T3, T4, and G4. The facilitative crown pruning will be agreed and carried out prior to the commencement of construction works by suitably qualified and experienced arborists.
Site Access	It is anticipated, given the site's location, that there will be no, or minimal machine / vehicle access required during construction works. Temporary ground protection will be used to minimise soil degradation and compaction where traffic is likely to require access during the construction process. This is shown on Appendix 4 – TPP as orange crosshatch and detailed further in Appendix 5 – AMS. It will be important to ensure that any concrete that is used to secure support posts into place is mixed away from the RPA of retained trees, or on bunded ground protection to ensure that they are not affected by any potentially phytotoxic leachates from the wet cement.

Element	Detail
Services and Soakaways	It is not anticipated that any services or drainage will be required in association with this development.

6. Tree Management and Replanting Proposals

6.1 Remedial tree work has been specified in column 12 of Appendix 1 for arboricultural and health and safety reasons. The work is not considered urgent, but it is recommended that it is carried out within 12 months of the date of this report, or prior to the commencement of works, whichever is soonest.

6.2 This schedule does not refer to, and is superseded by, any requirements for tree felling for development purposes that may be required.

6.3 Please note that the inspection of trees on site was of a preliminary nature, gathering, as set out in the British Standard, only information needed to assess tree constraints. While any obvious tree defects that may constitute a risk have been recorded in the survey and appropriate remedial work specified this assessment does not constitute a full tree health and safety survey. In particular inaccessible trees, trees with heavy Ivy cover and trees within groups have not been inspected fully and dimensions estimated. However, any comments on the trees relating to health and safety remain valid for 12 months from the date of this report after which the trees will require re-inspection.

6.4 Four B category trees (T7, T8, G1 x 2) and four C category trees (T2, T9, G2 x 2) will be removed for development purposes.

6.5 In order to mitigate the loss of the above trees a minimum of eight new heavy standard rootballed or containerised trees (12 to 14cm stem girth) will be planted. The species will be selected to be in keeping with the area, and with Pensthorpe Natural Park's aims of wildlife conservation and habitat provision.

6.6 The trees will be maintained for a 5 year period. Work will include keeping a circular area with a 0.5m radius centred on the stem of the tree/s free from weed growth using either herbicide or mulch, checking supports and guards and replacing any failures during the period with trees of the same species and quality.

7. Further Arboricultural Input into the Design Process, Construction and Aftercare

7.1 A Tree Protection Plan (TPP), Arboricultural Method Statement (AMS) and Timetable for implementation of Tree Protection Works form Appendices 4, 5 and 6, respectively.

7.2 The AMS contains a timetable for implementation of the tree protection works. No work will commence until the protective fencing is in place.

7.3 If the proposed layout of the development changes it will be necessary to revise this report.

8. Permissions and Constraints

8.1 According to the GIS on the North Norfolk District Council website, accessed on the 13 November 2023, none of the trees on or adjacent to the site are the subject of a Tree Preservation Order (TPO), nor is the site within a local authority Conservation Area. However, TPOs can be issued immediately and with no prior notice and therefore, an additional check should be carried out prior to the commencement of any tree works or works that might affect the condition of trees.

8.2 To assist the planning process the LPA should be provided with a copy of this report and invited to comment on the proposals.

8.3 When dealing with developments close to trees, special attention should be paid to related legislation ensuring that the Wildlife and Countryside Act (1994), Conservation of Habitats and Species Regulations (2010) and the Countryside Rights of Way Act (2000) are adhered to. It must be ensured that nesting birds and protected species such as bats and reptiles are considered and protected.

9. Conclusions

9.1 Four B category and four C category trees and will be removed for development purposes and replaced with new heavy standard trees.

9.2 Whilst bridges and walkways will all be above ground, their support posts and anchors will require excavation within the RPA of retained trees. Therefore, careful digging will be carried out to ensure major roots are not severed, whilst roots will also be protected from leachates from any wet concrete used.

9.3 Temporary ground protection will be put in place to minimise the impact of any construction works within the RPA of retained trees.

9.4 In order to either provide sufficient clearance for the construction and use of the bridges and walkways, or to provide suitable viewing points from the platforms, it will be necessary to carry out facilitative crown pruning across the site.

9.5 Works will need to be carried out carefully and adhering to the tree protection measures throughout the construction process in order to minimise the impact to retained trees.

G. G. Robbie, BSc Hons For, MICFor, M Arbor A
A.T. Coombes Associates Ltd
19 December 2023

APPENDIX 1-
TREE SURVEY SCHEDULE

SITE: Pensthorpe Natural Park, Pensthorpe Road, Fakenham NR21 0LN

SURVEY COMPLETED: 29/9/2023

1	2	3	4	5	6				7	8	9	10	11	12	13	14	15	16
Tree No.	**Species**	**Ht (m)**	**Stem dia (mm)**	**No of Stems**	**Branch Spread**				**Height and Direction of First Branch (m)**	**Mean Canopy Ht**	**Life Stage**	**Physiological Condition**	**Structural Condition**	**Preliminary Tree work**	**Estimated remaining contribution (Yrs)**	**Cat grading**	**Radius of RPA (m)**	**RPA (sq m)**
					N	**E**	**S**	**W**										
T1	Silver birch	10.6	516	5	5.2	5.0	6.0	4.2	1.0 W	0.0	M	Fair - Moderate vitality	Good	-	20+	B1	6.2	120.3
T2	Silver birch	9.0	221	4	3.0	2.5	1.5	3.5	.01 N	0.0	SM	Fair - Moderate vitality	Moderate - Leaning to north	-	10+	C1	2.7	22.1
T3	Oak	15.0	528	2	6.8	7.5	4.9	7.0	2.3 E	0.0	EM	Good	Moderate - Deadwood in crown and tight union	Remove deadwood	20+	B1	6.3	126.1
T4	Downy birch	14.0	550	1	4.4	5.5	6.0	5.0	2.0 E	0.0	M	Good	Good	-	20+	B1	6.6	136.9
T5	Silver birch	15.5	590	3	5.2	5.0	5.0	5.2	2.0 N	0.0	M	Good	Good	-	20+	B1	7.1	157.6
T6	Oak	5.8	190	1	2.5	3.1	2.5	1.9	0.4 N	0.0	SM	Fair -	Good	-	10+	C1	2.3	16.3
T7	Downy birch	13.0	150	1	5.0	7.8	2.6	3.4	8.0 N	4.0	EM	Good	Good	-	20+	B1	1.8	10.2
T8	Downy birch	14.5	581	3	9.0	5.2	5.7	3.9	3.0 N	4.0	EM	Good	Good	-	20+	B1	7.0	152.9
T9	Oak	5.0	200	1	5.0	5.5	1.5	2.9	1.0 S	0.8	SM	Good	Good	-	20+	C1	2.4	18.1
T10	Downy birch	9.0	198	2	3.0	2.0	0.5	2.0	3.0 N	2.0	SM	Fair - Moderate vitality	Good	-	10+	C1	2.4	17.7
T11	Oak	4.0	86	2	3.5	3.0	1.0	2.1	1.5 N	1.0	Y	Good	Good	-	20+	C1	1.0	3.3
T12	Downy birch	14.0	172	2	2.1	3.0	1.0	1.5	5.0 N	8.0	SM	Good	Moderate - Deadwood in crown	Remove deadwood	20+	C1	2.1	13.4
T13	Downy birch	15.0	465	3	6.0	5.7	3.5	4.0	6.0 N	6.0	EM	Good	Good	-	20+	B1	5.6	97.8
T14	Downy birch	9.0	274	3	3.0	3.0	3.0	3.0	-	-	OM	Dead	Dead	Remove tree	<10	U	3.3	34.1
T15	Oak	8.5	140	1	3.5	3.0	2.0	1.5	1.0 S	0.0	SM	Good	Good	-	20+	C1	1.7	8.9
T16	Silver birch	15.5	370	1	2.5	2.5	2.5	2.5	5.0 W	5.0	EM	Good	Good	-	20+	B1	4.4	61.9

SURVEYED BY A.T. COOMBES ASSOCIATES

# denotes estimated dimensions due to lack of access to tree

APPENDIX 1-
TREE SURVEY SCHEDULE

SITE: Pensthorpe Natural Park, Pensthorpe Road, Fakenham NR21 0LN

SURVEY COMPLETED: 29/9/2023

1	2	3	4	5	6				7	8	9	10	11	12	13	14	15	16
Tree No.	**Species**	**Ht (m)**	**Stem dia (mm)**	**No of Stems**	**Branch Spread**				**Height and Direction of First Branch (m)**	**Mean Canopy Ht**	**Life Stage**	**Physiological Condition**	**Structural Condition**	**Preliminary Tree work**	**Estimated remaining contribution (Yrs)**	**Cat grading**	**Radius of RPA (m)**	**RPA (sq m)**
					N	**E**	**S**	**W**										
T17	Oak	14.0	450	1	7.5	8.2	5.9	3.5	2.3 N	0.0	EM	Good	Good	-	20+	B1	5.4	91.6
G1	Downy birch	14.5	336	3	4.0	4.0	4.1	4.0	0.2 S	0.0	EM	Good	Good	-	20+	B1	4.0	50.9
G2	Oak & alder	8.0	180	1	3.5	2.1	0.0	2.1	-	0.0	SM	Fair - One sided	Moderate - Leaning to north	-	10+	C1	2.2	14.7
G3	Dead trees	8.0	150	1								Dead	Dead	Remove trees	<10	U	1.8	10.2
G4	Downy birch & silver birch	14.5	422	4	5.0	5.6	5.0	4.0	-	2.0	EM	Good	Good	-	20+	B1	5.1	80.4
G5	Silver birch	15.5	560	2	6.0	6.3	5.4	7.0	3.5 E	1.0	M	Good	Good	-	20+	B1	6.7	142.1
G6	Silver birch	14.0	170	1	3.0	4.0	4.0	2.5	1.5 S	0.5	SM	Good	Good	-	20+	C1	2.0	13.1

SURVEYED BY A.T. COOMBES ASSOCIATES

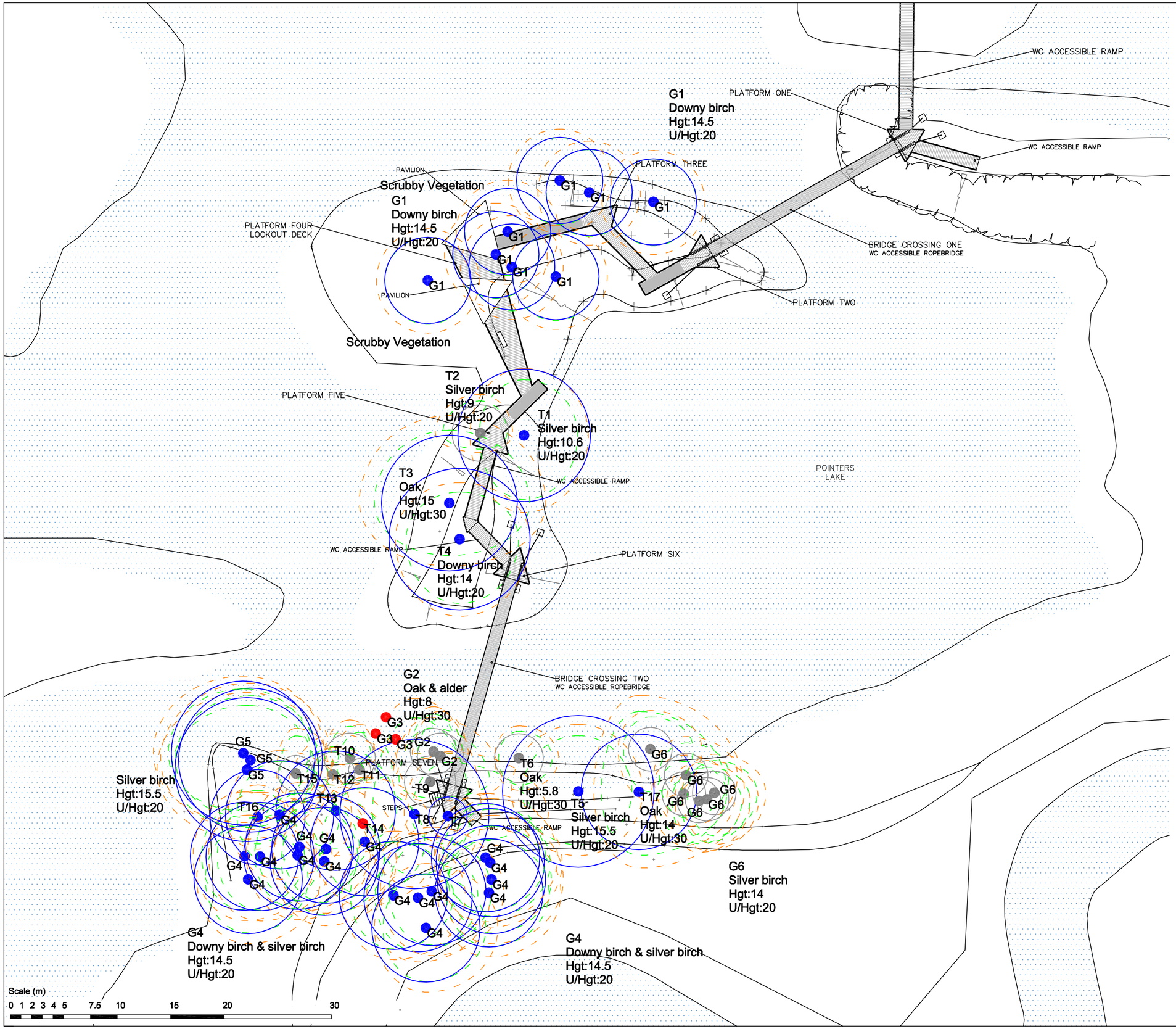
# denotes estimated dimensions due to lack of access to tree

Appendix 2: Notes on the Column Headings in Appendix 1

Col#	Title	Notes
1	Tree No.	Tree numbers to correspond with those shown on the TCP.
2	Species	Each tree has been identified and the common name given in each case.
3	Ht (m)	Height of the tree
4	Stem dia (mm)	The stem diameter measured in millimetres at 1.5 metres above ground. For multi-stemmed trees the stem diameter has been calculated according to the formula given in BS 5837:2012. For trees with up to 5 stems, each stem has been measured at 1.5m, squared and added together. The diameter shown is the square root of the total. For multi-stemmed trees with over 5 stems a sample of five diameters has been taken at 1.5m, averaged and squared, then multiplied by the total number of stems. The square root of this sum gives the stem diameter figure.
5	Number of Stems	Total number of stems on the tree.
6	Branch Spread	The branch spread measured in metres from the stem to the tip of the outer branches has been measured in four directions of the compass North, South, East and West.
7	Height and Direction of First Branch spread (m)	First significant branch and direction of growth (relative to the four cardinal compass points).
8	Canopy Ht	Mean height of the canopy above ground level.
9	Life Stage	The life stage of the tree has been assessed into one of the following categories: Y =Young, SM = Semi Mature, EM = Early Mature M = Mature, OM = Over mature and V = Veteran.
10 and 11	Condition	The British Standard recommends that a note is made of the structural and physical condition of the tree.

Col#	Title	Notes
12	Preliminary Management Recommendations	This column includes all work considered necessary to, as far as is practicable, ensure health and safety and for the good arboricultural management of the trees. These works are not associated with the development proposals. All work to be carried out to BS 3998: 2010 "Tree Work-Recommendations". Recommendations given in respect of Health and Safety remain current for 12 months from the date of this assessment after which further inspection is recommended. It should be noted that trees are dynamic structures subject to the forces of nature, which can fail without showing external symptoms.
13	Estimated remaining Contribution (Yrs)	The estimated remaining contribution of each tree in years has been assessed, using personal experience, into the following groupings: < 10 = Less than 10 years 10+ years = More than 10 years 20+ years = More than 20 40+ years = More than 40 years
14	Category grading	U = Those in such a condition that any existing value would be lost within 10 years and which should in the current context, be removed for reasons of sound arboricultural management. (Trees that have serious, irremediable structural defects, such that their early loss is expected due to collapse or ill health including trees that will become at risk due to the loss of other U category trees). **A** = Those trees of high amenity quality and value in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested) 1) Trees that are particularly good examples of their species if rare unusual or essential components of groups or formal or semi-formal arboricultural features 2) Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views in or out of the site, or those of particular visual importance. 3) Trees groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran tree or wood pasture)

Col#	Title	Notes
14 cont	Category grading cont	**B** = Those of Moderate quality and amenity value: those in such a condition as to a significant contribution (a minimum of 20 years is suggested) 1) Trees that might be included in the high category but are downgraded because of impaired condition (e.g. remediable defects) 2) Trees and woodland that forming distinct landscape features but do not form essential components 3) Trees with clearly identifiable conservation or other cultural benefits. **C** = Those of low quality and amenity value currently in adequate condition to remain until new planting is established (minimum of 10 years is suggested) or trees under 150 mm stem diameter. 1) Tree not qualifying in higher categories 2) Trees present in groups or woodlands but not with a significantly higher landscape value and or offering low or temporary screening benefit. 3) Trees with very limited conservation or other cultural benefits. Note: Category C trees are the least suitable for retention, where they would impose a significant constraint on the development their removal for development purposes may be considered acceptable by the LPA. Trees with a stem diameter under 150mm could be considered for relocation.
15	Radius of RPA (m)	The distance that would form the radius of a circular protection zone is given in metres calculated by multiplying the stem diameter given in column 4 by 12. The methods for calculating the stem diameter of multi-stemmed trees is given in section 4 above.
16	RPA (m^2)	The area of the RPA is given in square metres calculated by the following formula: Single Stemmed Trees; $$RPA\ m^2 = \left(\frac{(stem\ diameter\ mm\ @\ 1.5m \times 12)}{1000}\right)^2 \times 3.142$$ The methods for arriving at the stem diameter for multiple stemmed trees are described above in the notes for column 4.



Drawing Title:

Appendix 3 - Tree Constraints Plan

Site:

Pensthorpe Natural Park

Client:

Pensthorpe Natural Park

NORTH

To Scale 1:250 at A2

KEY

- B Category RPA
- C Category RPA
- U Category Tree
- Current Crown Spreads
- Ultimate Branch Spreads
- Shade Pattern

Drawn By: GR	Date: 19/12/23

TREE SURVEYS

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Drawing Title:

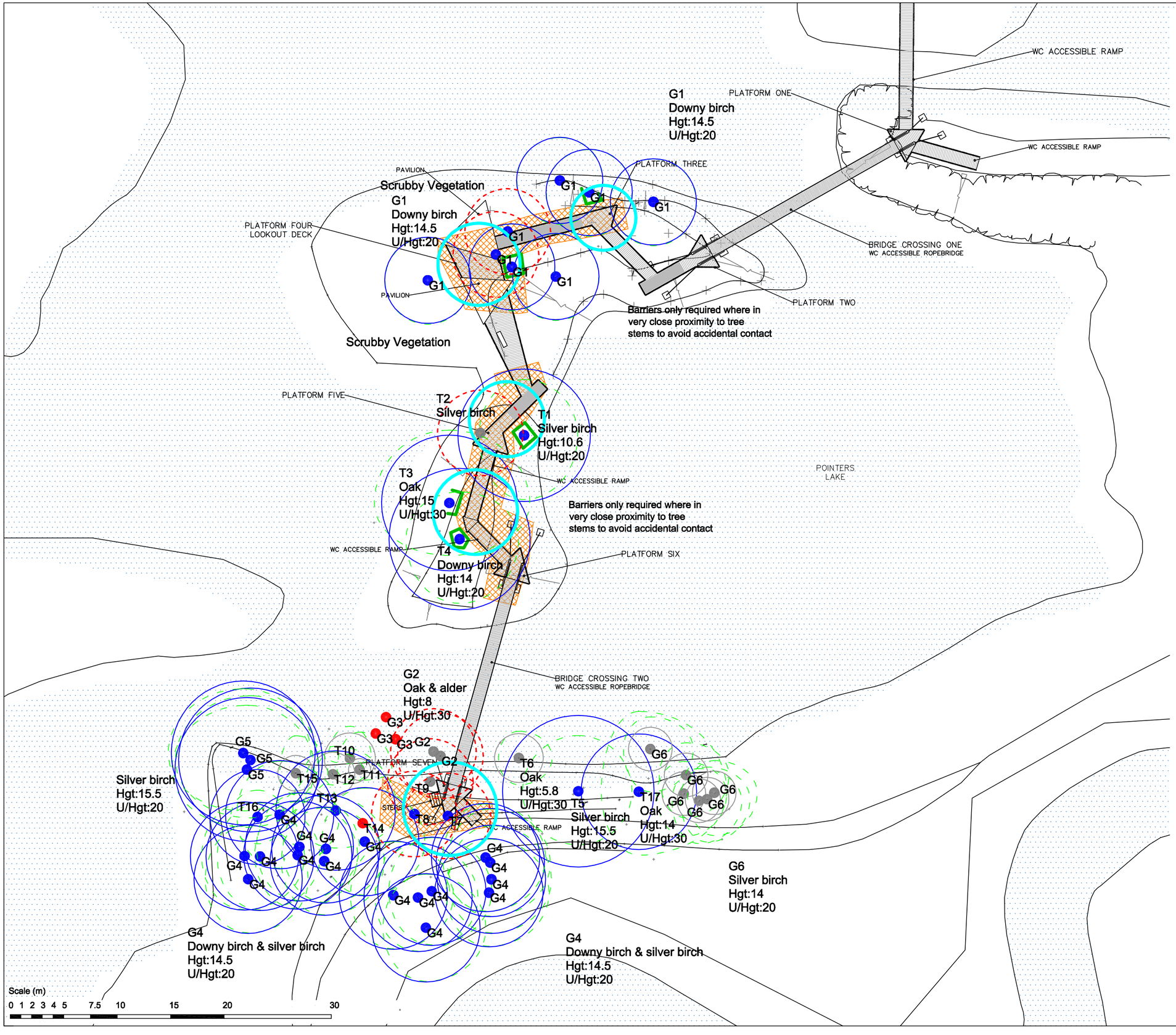
Appendix 4 - Tree Protection Plan

Site:

Pensthorpe Natural Park

Client:

Pensthorpe Natural Park



NORTH

To Scale 1:250 at A2

KEY

- Line of Temporary Protective Barriers
- Temporary Ground Protection
- Areas in which Careful Excavation and Root Pruning Required
- Trees to be Removed

Drawn By: GR	Date: 19/12/23

TREE SURVEYS

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Appendix 5: Arboricultural Method Statement for a Proposed Development at Pensthorpe Natural Park

1. Scope of the Works

1.1 The document provides a methodology for protection of trees during the construction of new bridges, raised walkways, viewing platforms and pavilions at the above site, and should be read in conjunction with the Tree Protection Plan Appendix 4 and Timetable for Protection Works Appendix 6.

1.2 The main features in the protection of the retained trees on site are as follows:

- Provision of temporary protective barriers
- Provision of temporary ground protection
- Use of careful excavation for supports and ground anchors
- Audited arboricultural site monitoring

1.3 A meeting between the site manager/main contractor and a consulting arboriculturist must take place prior to construction work commencing so that the above protection measures set out in this document can be discussed and agreed. At this point a list of contact details for all relevant parties will be produced and circulated including the Tree Officer of the Local Planning Authority.

1.4 Protective measures must be in place prior to any ground or construction works take place.

2. Timing of Works

2.1 Tree protection works will be completed as detailed below according to the attached timetable Appendix 6.

2.2 The exact commencement date is not known. However, the timetable provided gives the order that the works need to be implemented to ensure the trees are fully protected and states when specific arboricultural input will be required.

3. Tree Protection Barriers

3.1 Remaining trees will be protected by putting temporary protective barriers around the stems of trees where they are in close proximity to the proposed works. They will be required as shown on the TPP with a thick green line.

3.2 It may be best to protect stems using a triangle of three heras panels attached to each other, or wooden hoarding to prevent accidental contact. This can be discussed and agreed prior to construction works commencing to ensure the most efficacious and practical solution.

4. Temporary Ground Protection

4.1 Temporary ground protection will be required as shown on the TPP with orange crosshatching. It is likely that only pedestrian traffic will require ground protection.

4.2 The positioning of the ground protection should not be fixed according to the TPP, but should be positioned to ensure that there is maximum protection during the works. Therefore it may be moved to protect ground where it is most needed, rather than being set in place throughout the duration of the construction works.

4.3 The ground protection should be constructed as follows depending on the type of traffic that will use it:

- Pedestrian traffic only – a single thickness of scaffold boards on top of a driven scaffold frame to form a suspended walkway, or on top of a compression resistant layer (100mm woodchip) laid on top of a geotextile membrane.
- Light plant up to a gross weight of 2t, proprietary ground protection boards linked to one another on top of a compression resistant layer (150mm woodchip) laid on a geotextile membrane.
- Plant exceeding gross weight of 2t, a specification devised by an engineer will be designed in conjunction with the arboricultural consultant to support the loading that the ground will be subjected to.

4.4 Compaction of the soil can occur from a single pass of a heavy vehicle, especially in wet conditions, and therefore the ground protection must be put in place before any access is allowed.

5. Careful Excavation for Support Posts and Ground Anchors

5.1 The post holes for the walkway and for the ground anchors will be excavated using an airspade or hand tools. The areas where careful excavation is required are highlighted on the Tree Protection Plan.

5.2 If roots over 50mm diameter are found the position of the hole will be adjusted to avoid them, where possible.

5.3 If roots under this diameter are found, or if it is impossible to adjust the hole, roots will be pruned to the edge of the hole using a sharp handsaw or secateurs.

5.4 The holes will then be lined with a rootbarrier material to prevent the leaching of any phytotoxic material from the wet concrete.

5.5 This work will be carried out by a suitably trained operative and under arboricultural supervision.

6. Site Huts and Temporary Buildings

6.1 All site huts and temporary buildings will be sited outside the CEZ.

7. Additional Precautions

7.1 The movement of plant in proximity to retained trees should be conducted under the supervision of a banksman to ensure adequate clearance from the branches of the trees. Hydraulic cranes, forklifts, excavators or piling rigs (other than small rigs used for mini piling) must be avoided in the immediate vicinity the crown of the trees.

7.2 Cement, oil, bitumen or any other products which spillage would be likely to be detrimental to tree growth should be stored well away from the outer edge of the RPA of retained trees. Precautions should include ensuring all toxic liquids are stored in fully bunded containers. Equipment such as barriers or sandbags must be available on site to deal with any accidental spillages that may occur.

7.3 Lighting of fires on site should be avoided. Where they are unavoidable they must be at such a distance from retained trees that there is no risk of the heat causing fire damage to the trunk or branches. Full account must be taken of wind direction. Fires must be attended at all times until they are completely extinguished.

8. Service Trenches

8.1 It is anticipated that there will be no need for additional services or drainage associated with the proposed works.

8.2 Any overground services including CCTV must also be positioned to avoid the need for any regular or detrimental pruning to the trees.

9. Arboricultural Supervision and Aftercare

9.1 Arboricultural/site monitoring will be carried out throughout the construction phase by a nominated arborist who will be responsible for consultation with the Local Authority's Tree Officer.

9.2 The arborist will complete regular site visits to check that the tree protection measures are being carried out. The frequency of the visits will be dictated by the level of activity and degree to which the tree protection measures are being respected. A note of the date of each visit and a summary of the findings will be forwarded to both the Tree Officer and the Main Contractor to provide an audit trail enabling the proper implementation of the tree protection measures to be checked and verified.

9.3 There are three key stages where on-site arboricultural advice will be needed

- Prior to commencement, to review the contents of the AMS, and deal with any queries the main contractor may have.
- To confirm that the protective fencing and ground protection is in place appropriately as works progress.
- To supervise careful excavation and root pruning where in close proximity to retained trees.

9.4 On completion of the works the trees will be inspected by the arborist to check the condition of the trees and advise if any remedial work is necessary.

A.T. Coombes Associates Ltd
19 December 2023

Appendix 6: Timetable for Tree Protection Works at Pensthorpe Natural Park

Item	Operation *	Before Commencing Construction Works	During Construction Works	On Completion
1.	Carry out a pre-commencement site meeting to discuss any tree protection matters arising	X		
2.	Carry out tree work as detailed in Appendix 1, and any tree felling as set out in the AIA.	X		
3.	Erect temporary protective fencing (thick green line) around the tree stems specified in the AMS and TPP	X		
4.	Erect warning signs on fencing around each CEZ stating “Construction Exclusion Zone - Keep Out”.	X		
5.	Put temporary ground protection in place, as specified in the AMS and TPP as required during the works	X	X	
6.	Maintain Protective fences and signs in good condition.		X	
7.	Carry out careful excavation and root pruning for supports and ground anchors		X	
8.	Arboricultural supervision and advice including site visits during the course of the works to check the CEZ and liaison with the Local Authority.	X	X	X
9.	Remove protective fencing			X
10.	Check condition of the protected trees and consider if remedial works are necessary.			X
11.	Plant replacement trees.			X
	** All work to comply with the attached Arboricultural Method Statement and BS5837: 2012 Trees in relation to design, demolition and construction - Recommendations"*			