



ARBORICULTURAL IMPACT ASSESSMENT

Thames Lido, Napier Road, Reading
RG1 8FR

Ref: TL/0414/AIA/01

Date: 22nd April 2024

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1 Summary

- 1.1 The purpose of this report is to provide an assessment of the arboricultural impacts that arise from the extension of the existing car park at Thames Lido.
- 1.2 All trees that could be affected by the proposals have been considered in accordance with the guidance detailed in BS5837: 2012 "Trees in relation to design, demolition and construction - Recommendations".
- 1.3 The likely arboricultural impacts of the proposals are as follows:

Table 1: Summary of potential impacts

Impact	Trees Affected	Level of Impact	Proposed Mitigation	Residual Impact
Trees felled	G7 (part)	Low	Replacement planting	Very low
Removal of structures / hard surfaces within RPA	None	N/a	N/a	N/a
Building within RPA	None	N/a	N/a	N/a
Hard surfaces within RPA	T3, T4, T5 & T6	Low	No-dig construction methodology	Very low
Proximity of structures to retained trees	None	N/a	N/a	N/a

2 Introduction

2.1 Instructions

- 2.1.1 I have prepared this Arboricultural Impact Assessment on the instructions of Thames Lido, in support of a full planning application submitted to Reading Borough Council ('RBC').

2.2 Terms of Reference

- 2.2.1 The application relates to the extension of the existing car park at Thames Lido.
- 2.2.2 The purpose of this document is to provide the Local Planning Authority sufficient information to assess the likely impacts the proposed scheme will have upon the tree stock present and the effect of this on the character of the local area. It assesses how trees may be impacted by the construction of the proposals as well as how they may be affected by the change in use of the site. It also identifies any mitigation measures necessary to minimise the significance of these impacts as well as factors that will need to be considered when protecting retained trees.

2.3 Documents Provided

2.31 I have been provided with and referred to the following information in the production of this document:

- Current site layout: 740.51.K
- Proposed site layout: 740.51.N

2.4 Structure of Report

2.4.1 Section 3 of this document summarises the findings of the tree survey and provides a brief description of the site and any relevant statutory designations known to be in place along with relevant local planning policy.

2.4.2 Section 4 provides a summary of the constraints trees pose to development in general terms and forms the basis of the criteria against which the impacts identified in Section 5 are assessed. Sections 6 and 7 provide conclusions and recommendations respectively while Section 8 identifies those matters that will need to be addressed within an Arboricultural Method Statement.

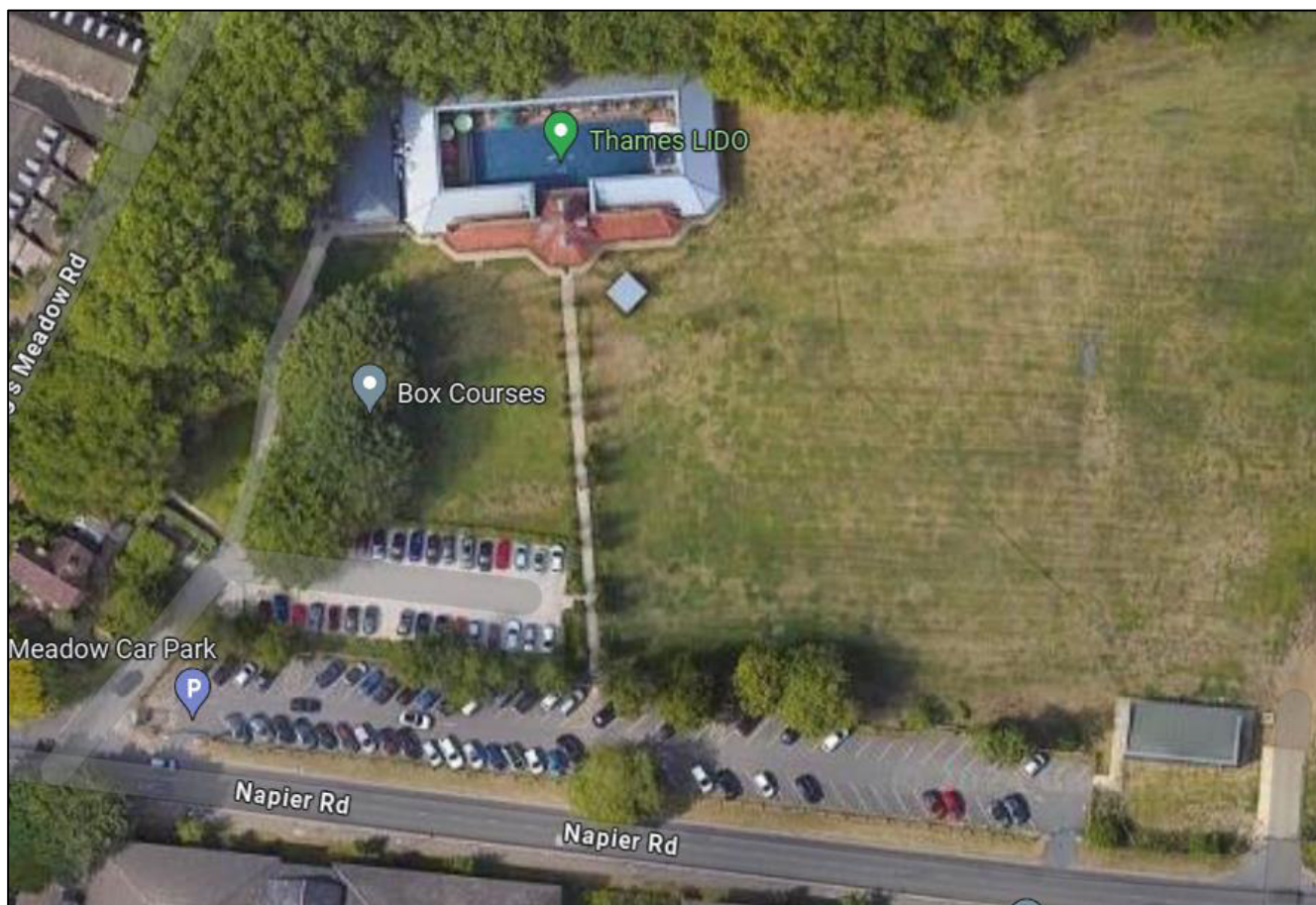
2.4.3 Full details of the surveyed trees are provided within Appendix 1. Appendix 2 contains works necessary to implement the scheme and which form part of the planning application.

2.4.4 Appendix 4 contains the Tree Constraints Plan which details tree locations, reference numbers species, category of retention, canopy extent and Root Protection Areas. These details are transposed onto the proposals to form the Indicative Tree Protection Plan in Appendix 5. This plan also details any tree removals necessary along with protective measures for retained trees.

2.5 Report Limitations

- 2.5.1 The survey of the trees is of a preliminary nature only and does not assess the degree of risk they may pose.
- 2.5.2 The trees were surveyed on the basis of the Visual Tree Assessment (VTA) method as developed by Mattheck and Breloer (1994) and were surveyed from ground level only with no climbing inspections undertaken. It is not always possible to access every tree and as such some measurements may have to be estimated. Where this has been necessary, it will be highlighted in Appendix 1.
- 2.5.3 Trees are living organisms whose health and condition can change rapidly; the health, condition and safety of trees should be checked on a regular basis, preferably at least once a year. The conclusions and recommendations in this report are based upon the assumption that the trees will be inspected on an annual basis in the future and therefore are only valid for a period of one year.
- 2.5.4 This period of validity may be reduced in the case of a change of conditions to or in proximity to the tree. Such changes may include but are not limited to: changes in ground level, tree works, extreme weather events or hydrological changes.
- 2.5.5 Assessment as to whether protected species such as birds, bats, bees or badgers may be affected by any tree works recommended herein has not been made. Specialist ecological advice should be obtained before carrying out any tree works with the potential to affect protected species.

3 Findings



Photograph 1: Aerial view of application site (Source: Google Earth)

3.1 Site Visit

- 3.1.1 I visited the site on the 27th of March 2024 recording relevant qualitative data in order to assess the condition of the trees present and any constraints they may pose to development in accordance with BS5837: 2012.

3.2 The Site

- 3.2.1 The site comprises part of a large grassed field and stands to the immediate east of the existing Lido car park and the immediate north of an NCP car park.

3.3 Surveyed Trees

- 3.3.1 A total of 9 individual trees and 4 groups of trees were surveyed, of which 3 are of high quality (A category), 7 are of moderate quality (B category) and 3 are of low quality (C category).
- 3.3.2 A full schedule of tree condition is included within this document at Appendix 1.

3.4 Statutory Tree Protection

- 3.4.1 Information available on Reading Borough Council's website indicates that there are no Tree Preservation Orders in place on any tree on or adjacent to the site nor does it lie within a Conservation Area.

3.5 Planning Context

- 3.5.1 Relevant local planning policy comprises Policy CS38 of the Reading Borough Local Development Framework Core Strategy.

4 General Tree Constraints

- 4.1 In general terms, the constraints trees pose to development arise from the space they occupy or require to maintain viability above and below the ground and from how development of a site will affect the relationship between its occupiers (if any) and the trees present.
- 4.2 Above ground constraints primarily arise from the spread and height beneath a tree's crown while below ground constraints comprise the Root Protection Area (RPA) around each retained tree. BS5837: 2012 defines a tree's RPA as a "*layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority*". Paragraph 4.6.2 of the Standard states that this is calculated as an area equivalent to a circle with a radius 12 times the stem diameter. It must be remembered that the circular RPA put forward in the British Standard is a notional, arbitrary representation of the minimum area to be protected rather than an accurate representation of where the roots are likely to be found.
- 4.3 Paragraph 4.6.2 of the British Standard goes on to state that where pre-existing site conditions or other factors indicate that rooting is likely to have occurred asymmetrically, a polygon of equivalent area shall be produced that reflects a soundly based arboricultural assessment of the likely root distribution.

- 4.4 The default position of BS5837: 2012 is that structures should be located outside the RPAs of trees to be retained. Whilst the Standard also recognises that overriding design reasons may justify construction within RPAs, this is dependent upon the use of technical solutions such as low-invasive foundations that may not be appropriate to every site.
- 4.5 Beyond the spatial constraints trees pose to development of a site, consideration must also be given to the likelihood of factors such as shading, the need to maintain clearance to spreading canopies, honeydew drip and concerns over safety leading to undue pressure to prune or remove retained trees.
- 4.6 The quality of a tree in question also has a bearing on the significance of the constraint it poses. Ordinarily, only moderate quality (category B) and above trees will pose a constraint to development although the removal of significant numbers of low quality (category C) trees may pose a constraint in certain circumstances.

5 Arboricultural Impacts of Proposals

5.1 Direct Impacts

Table 2: Direct impacts of proposals

Tree Number	Type of Impact
T3	Car Park Construction within RPA
T4	Car Park Construction within RPA
T5	Car Park Construction within RPA
T6	Car Park Construction within RPA
G7	Part-felled to facilitate development

- 5.1.1 The principal impact of the proposals comprises the removal of the 6 stems from G7 that are growing along the existing car park's eastern boundary. These trees are of such a young age that their loss can be readily mitigated with replacement planting.
- 5.1.2 Potential impacts to retained trees arise from the encroachment of the RPA of the four trees listed above by the extended car park. The degree of encroachment means that a no-dig construction methodology and porous finished surface are required to prevent potentially significant impact to these trees. This is a widely adopted form of mitigation for such works and provided its installation is as per the manufacturer's specification and wider construction activities are adequately controlled, the overall impacts are assessed as being likely to be very low.

- 5.1.3 BS5837: 2012 establishes at Paragraph 5.3.1 that RPA encroachments may be necessary with the proviso that in such cases, the project arboriculturalist should a) demonstrate that the tree(s) can remain viable and that the area lost to development can be compensated for elsewhere, contiguous with its RPA and b) propose a series of mitigation measures to improve the soil environment that is used by the tree for growth.
- 5.1.4 Tree viability is most likely to be threatened by root loss resulting in a compromised ability to uptake primarily water but also nutrients. There is relatively little published science on the effect of root loss on established trees, a deficit exacerbated by the need to consider the loss of parts of a tree's RPA rather than its entire root system. However, Benson *et al.* (2019a) found significant differences in trunk diameter growth only when all roots beyond 3x stem diameter were severed, significant differences in shoot extension growth only when all roots beyond 9x stem diameter were severed and significant differences in leaf area index only when all roots beyond 3x stem diameter were severed. Further to this research, Benson *et al.* (2019b) found that trees subjected to trenching at a distance of approximately 5x their stem diameters were able to bring physiological processes back to expected norms following a period of stress even when the trenching had been undertaken on three sides of the tree. Benson *et al.* (2019c) found that 440 days after trenching on one side only, mature trees subjected to trenching undertaken at 6x the diameter of their stem distance were able to regain physiological function and that tree growth had returned to normal levels.
- 5.1.5 In more general terms, Coder *et al.* (2006) assert that a healthy tree can tolerate the loss of 30-50% of its root system. This is supported by the work of Pretzsch *et al.* (2016) who found that mature trees who lost up to 40% of their roots were able to recover within three years.

- 5.1.6 On the basis that the RPA encroachments necessary in these proposals represent only a fraction of the root loss referenced to in the studies above, it can be demonstrated that the affected tree(s) can remain viable. Compensatory areas equivalent to those lost to development are shown on the Indicative Tree Protection Plan in Appendix 4. Measures to improve the soil environment that is used by the tree for growth are provided at Section 5.4 below.

5.2 Indirect Impacts

- 5.2.1 The nature of the proposals means that indirect impacts are highly unlikely to occur.

5.3 Infrastructure Requirements

- 5.3.1 I understand that no new services are required. If this is not the case, the installation of services within the rooting zones of trees can have a large detrimental impact on the long-term survival of retained trees leading to their unnecessary loss or root failure in high winds. It should not be assumed that it will be possible to install services within a retained tree's RPA.

5.4 Mitigation Measures

- 5.4.1 The landscape impact of tree losses can be offset by the landscape proposals, ideally involving new planting of ornamental varieties of native species, and where appropriate with columnar or compact form.
- 5.4.2 The car park encroachment will require a no-dig construction technique, using a cellular confinement system with no fines aggregate for the sub-base. The degree of encroachment means that a permeable paving surface (e.g. gravel or block paving) is required. The finished section is likely to be up to 150mm above grade, depending on final specification, which will need to be factored into the overall finished site levels. The cellular confinement system with a temporary hard surface (e.g. road stone) can be used for site access during construction and the surface material replaced on completion of construction.

6 Conclusions

- 6.1 9 individual trees and 4 groups of trees were assessed as having the potential to be affected by the proposals. Of these 1 group is to be part-felled and 4 have their RPAs encroached.
- 6.2 The trees to be felled are of low individual or collective value and their loss will not affect the character of the local area over the long-term, provided replacement plantings are included as part of a landscaping scheme.
- 6.3 The low level of RPA encroachment(s) mean that the affected tree(s) will remain viable with equivalent compensatory areas provided. Mitigation measures to improve the soil environment that is used by the tree for growth have been specified.
- 6.4 Working methods will need to be controlled to ensure that impacts to retained trees do not exceed those identified herein.
- 6.5 On the basis that the mitigation methods specified within this document are adhered to and that retained trees are adequately protected through development, the arboricultural impacts of the scheme are considered very low. The proposals therefore comply with Policy CS38 of the Reading Borough Local Development Framework Core Strategy.

7 Recommendations

- 7.1 Recommendations for works required to facilitate development are found in Appendix 2. Any tree removals recommended within this report should only be carried out with Local Authority consent.
- 7.2 Retained trees will need to be protected by the mitigation methods detailed in Sections 5.4 and 8. This is likely to require the production of an Arboricultural Method Statement to formalise these arrangements.

8 Arboricultural Method Statement Heads of Terms

- 8.1 Subject to any condition of planning consent granted, the following items may need to be fully addressed in an Arboricultural Method Statement. The successful retention of those trees identified herein as remaining on and adjacent to the site is dependent upon the quality of protective measures put in place and adherence to constructional variances proposed to mitigate potential impacts.
- 8.2 Retained trees will need to be protected by appropriate barriers that will form a Construction Exclusion Zone (CEZ). Within the CEZ the following activities are prohibited:
- Storage of materials or plant;
 - Excavations;
 - Level changes;
 - Mixing of materials / chemicals;
 - Fires;
 - Use of herbicides.
- 8.3 Parts of retained trees' RPAs that lie outside the CEZ will require ground protection appropriate for the anticipated loading.
- 8.4 Indicative locations of protective measures are shown on the Indicative Tree Protection Plan appended to this report.
- 8.5 Further items that may need to be addressed include:
- Contact details of relevant parties
 - Site supervision details
 - Site layout / logistics
 - Methods of removal of existing structures / surfaces
 - Constructional variances required to minimise damage to adjacent trees
 - Landscaping details

9 References

- Benson, A., Koeser, A.K., Morgenroth, J. (2019a). A test of tree protection zones: Responses of *Quercus virginiana* Mill trees to root severance treatments. *Urban Forestry & Urban Greening*. 38: 54-63
- Benson, A., Koeser, A.K., Morgenroth, J. (2019b). The effects of root pruning on growth and physiology of two *Acer* species in New Zealand. *Urban Forestry & Urban Greening*. 38: 64-73
- Benson, A., Koeser, A.K., Morgenroth, J. (2019c). Responses of mature roadside trees to root severance treatments. *Urban Forestry & Urban Greening*. 46: 126448
- British Standards Institute. (2012). *Trees in relation to design, demolition and construction - Recommendations*. London: BSI Standards Limited
- Coder, K.D., Helliwell, R., Watson, G.W. (2006). 'Protecting Trees During Excavation' in Roberts, J., Jackson, N., Smith, M. (eds.) *Tree Roots in the Built Environment*. Norwich: The Stationary Office, pp. 240-280
- Pretzch, H., Bauerle, T., Haberle, K.H., Matyssek, R., Schutze, G., Rotzer, T. (2016). Tree diameter growth after root trenching in a mature mixed stand of Norway spruce (*Picea abies* [L.] Karst) and European beech (*Fagus sylvatica* [L.]). *Trees*. 30: 1761-1773

Appendix 1 – Schedule of Tree Condition and Retention Category

Scientific Names

Key:

Age Class:

Y - Young **S-M** - Semi-mature **EM** - Early mature **M** - Mature **OM** - Over mature

Condition:

P = Physiological

Good - no significant health problems

Fair - symptoms of ill health that can be remediated

Poor - significant ill health

S = Structural

Good - no significant defects

Fair - significant defects that can be remediated.

Poor - Significant defects no remedy

Category of retention:

U - Unsuitable for retention regardless of development

A - High quality value

B - Moderate quality value

C - Low quality value

1 - Mainly arboricultural qualities

2 - Mainly landscape qualities

3 - Mainly cultural values, including conservation

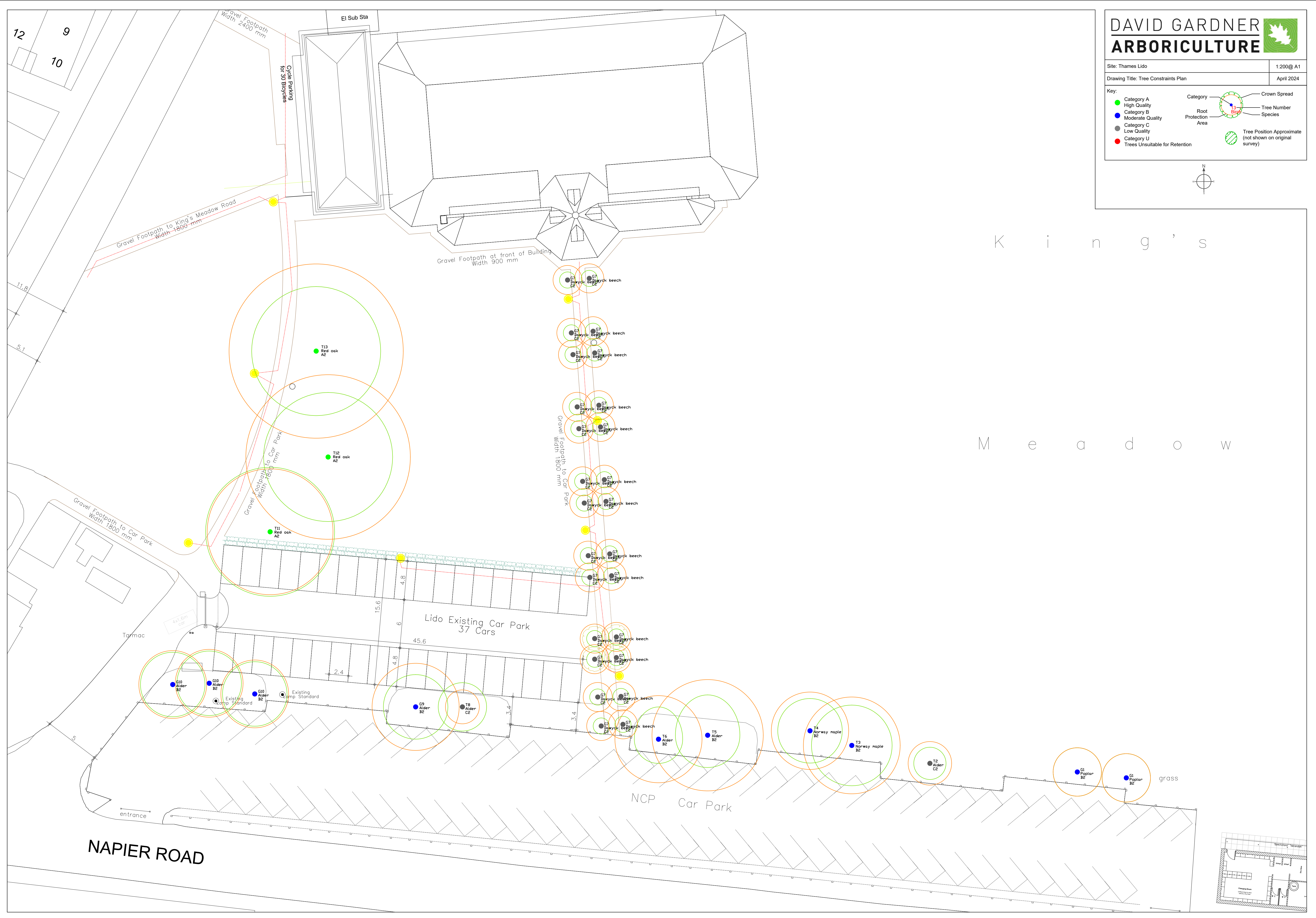
RS = Remote Survey Only

Tree No.	Species	Height (m)	Crown spread (m)				Crown ht (m)	Diameter (mm)	Vitality	Structural condition	Maturity	Life expectancy	Observations	BS Category
			N	E	S	W								
G1	Poplar	12	3	3	3	3	3	250	Fair	Fair	EM	40+	RS only. Lean over adjacent car park	B2
T2	Alder	8	2	2	2	2	4	220	Fair	Fair	EM	20+	Slightly thinning crown.	C2
T3	Norway maple	14	5	5	5	5	3	485	Good	Fair	M	40+		B2
T4	Norway maple	10	4	4	4	4	2	410	Good	Fair	EM	40+		B2
T5	Alder	14	5	4	4	4	8	580	Good	Good	M	20+		B2
T6	Alder	9	4	3	3	3	6	460	Good	Fair	M	20+		B2
G7	Dawyck beech	5	1	1	1	1	0.5	125	Good	Good	Y	40+	Avenue of young trees lining path to lido	C2
T8	Alder	8	3	3	3	3	2	180	Good	Good	SM	40+		C2
G9	Alder	12	4	4	4	4	4	450	Fair	Fair	M	20+		B2
G10	Alder	14	4	4	4	4	3	340	Fair	Fair	M	20+		B2
T11	Red oak	15	8	8	8	8	5	650	Fair	Fair	M	40+		A2
T12	Red oak	15	8	8	8	8	5	850	Fair	Fair	M	40+		A2
T13	Red oak	15	8	8	8	8	5	900	Fair	Fair	M	40+		A2

Appendix 2 - Tree Works to Facilitate Development

Tree No.	Species	Vitality	Structural condition	Maturity	Life expectancy	Observations	BS Category	Recommended Works to Facilitate Development
G7	Dawyck beech	Good	Good	Y	40+	Avenue of young trees lining path to lido	C2	Part-fell (see plan for details)

Appendix 3 - Tree Constraints Plan



Appendix 4 - Indicative Tree Protection Plan

