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BS5837 2012 Trees in Relation to Design, Demolition and Construction

At

Poole Park Miniature Railway Shed
Poole Park
Poole
BH14 8AN

Date of report
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Report by
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Summary

The report has been written following the recommendations and guidance given within British Standard 5837 (2012), Trees in relation to design, demolition and construction. to provide a reasoned assessment of the potential impact to trees by the proposed development at Poole Park Miniature Railway Shed.

Within the site stands the existing railway shed and a composting/storage Area. There are mature parkland trees throughout the site. A lake lies to the north of the Railway Shed and composting area, and a high frequency footpath runs adjacent to the southern edge of the building.

Seven significant trees have been identified which may be adversely affected by development if reasonable care is not taken to protect the trees and their rooting systems.

Some protective crown lifting has been recommended to prevent mechanical damage from the development.

Trees adjacent to the development area, are unlikely to be adversely affected, provided that adequate precautions to protect the trees are implemented through the Arboricultural Method Statement within this report.

Glossary

Term	Meaning
RPA	Root Protection Area
CEZ	Construction Exclusion Zone
BS5837:2012	British Standard for trees in relation to demolition, designs and construction
BS3998:2010	British Standard: tree work recommendations
AIA	Arboricultural Impact Assessment
AMS	Arboricultural Method Statement
TPP	Tree Protection Plan

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APPENDIX A – TREE SURVEY DATA

APPENDIX B – SITE PLAN SHOWING RPAs, APPROXIMATE CROWN SPREAD and TREE PROTECTION MEASURES

1 Introduction

- 1.1 On instructions received from Cally Barnes, Project Manager at Poole Borough Council, David Soffe-Hill M.Arbor.A, principle consultant for Complete Arb Services Ltd, undertook a ground level, visual assessment of the trees that could be affected by the development proposal in accordance with BS5837 2012 and best practice and to prepare the following to accompany a planning submission: -
 - A schedule of the relevant trees to include survey data and a condition assessment.
 - An appraisal of the constraints imposed by the trees and the potential consequences for the local amenity.
 - A preliminary Arboricultural Method Statement setting out appropriate protective measures and management for trees to be retained.
- 1.2 Each tree has been given a class rating and Root Protection Area (RPA) measurement worked out using the recognised method detailed within BS5837 2012. BS5837 2012 Tree Quality Assessment Definitions are given in Appendix C.
- 1.3 For the purposes of this survey, a drawing of the site, adapted from drawing number “BCP PPR_CONS_PL_01, provided by Cally Barnes, Project Manager for Poole Borough Council, has been included to show tree IDs, categories and locations of trees within influencing distance of Poole Park Miniature Railway Shed. (See Appendix B).
- 1.4 All trees of material consideration within and immediately adjacent to the proposed development site have been inspected. These trees are listed at Appendix A and annotated on the Tree Plan at Appendix B.

Methodology

- 1.5 The Arboricultural site survey was carried out on 3rd August 2019. Weather conditions at time of inspection were overcast and dry with good visibility.
- 1.6 All observations were carried out from ground level without detailed investigations and all dimensions estimated unless otherwise indicated.
- 1.7 This report is prepared in line with the British Standard: BS5837:2012 - Trees in Relation to Demolition, Design and Construction. The purpose of the report is to provide arboricultural information and recommendations for the support of the Poole Park Miniature Railway Shed planning application.
- 1.8 The British Standard makes provision for trees to be categorised for both quality (A, B, C or U) and a sub-category for each of 1, 2 or 3. Details of these categories are included in paragraphs 2.7. A full description of the trees found, and their categories, is included in the tree survey data provided in Appendix A.

- 1.9 A Tree Survey is carried out and relevant information about each tree is recorded in a data table. The data table includes stem diameter measured from 1.5m above ground level, height, crown spread, age class, and physiological and structural condition. A tree quality assessment using the data is then formulated to categorise trees for removal or retention.
- 1.10 Stem diameters are used to calculate the root protection areas (RPAs), which have been plotted and adjusted for site features, (see Appendix B). The RPA is the area in which most tree roots are anticipated to be growing. As root damage is a common cause of tree loss, the RPA is an area of provisional exclusion for construction activity.
- 1.11 Trees are a material consideration in the planning process and, as such, must be included as part of the decision-making process.

Caveats and limitations

- 1.12 The purpose of this report is to determine any constraints that need to be considered in relation to trees – both above and below ground – during the development design, to assess the potential impact of the development to the amenity value of trees, and to provide an Arboricultural Method statement with Tree Protection Plan in order to minimise, as far as is practical, damage to trees and their rooting systems.
- 1.13 Only trees with diameters greater than 75mm diameter and woodland groups with stems of 150mm or greater are included in the survey.
- 1.14 Root protection areas are calculated in line with BS5387:2012 and are adjusted to reflect topographical constraints on site. This is based on professional experience and has not been confirmed by trial pitting. There is a level of unpredictability in calculating exact tree root locations and therefore, where there is a possibility of obstruction or damage to roots, trial holes are recommended prior to construction.
- 1.15 The Arboricultural Method Statement outlined in section 5 of this report must be agreed with planning before the commencement of any works.
- 1.16 Trees are living organisms whose health and overall condition can change rapidly. The conclusions and recommendations contained within this report are valid for a period of twelve months. The period of validity may be reduced if significant changes occur to either the trees or to the landscape within the immediate proximity of the trees.

2 Arboricultural survey summary

Site overview



Images courtesy of Map data@2019 Google

- 2.1 Within the site stands the existing railway shed and a composting/storage area. There are mature parkland trees throughout the site. A lake lies to the north of the Railway Shed and composting area, and a high frequency footpath runs adjacent to the southern edge of the building.

Tree Preservation Orders and other legal restrictions

- 2.2 The Poole Borough Council interactive mapping system shows these trees are subject to conditions imposed by Poole Park Conservation Area. Tree works may not be carried out in this area without prior consent from the Planning Authority.

Arboricultural survey

- 2.3 For detailed tree survey information, see the Tree Survey Data in Appendix A.
- 2.4 Some remedial pruning has been recommended to prevent mechanical damage to low branches. No trees have been identified for removal to facilitate the proposed development.
- 2.5 Smaller trees and understory vegetation adjacent to the site have not been included as part of this Arboricultural report.

- 2.6 Trees are categorised in line with BS5837:2010 Trees in Relation to Design, Demolition and Construction as follows:

Table 1: Tree categories in line with BS5837:2010

A	Trees of high arboricultural value that should be retained and protected throughout the development. Veteran trees are automatically awarded 'A' status.
B	Retention preferable. Trees of good condition and character which are appropriate for the location and in good physiological and structural condition. These trees should be retained unless they will be a severe impediment to the proposal or there is an overriding public interest that warrants their removal.
C	Trees of generally lower arboricultural value by dint of character or condition. 'C' trees should not be a constraint on development.
U	Trees that should be removed on arboricultural grounds. Often trees in poor condition can be left 'in situ' until a proposal means the potential target increases, making their removal more urgent or necessary.

Trees are further categorised into sub-categories, using a numerical suffix to denote the following perceived values:

Table 2 Tree sub-categories in line with BS5837:2010

1.	Trees of primarily arboricultural qualities. High value trees might be because they are particularly good examples of their species, because they are rare or unusual or because they are important components of a group feature such as an avenue.
2.	Trees of landscape importance – for example, trees of particular visible importance in a setting or view.
3.	Trees of cultural value. This may be due to historic links or conservation value – such as veteran trees or commemorative trees.

For example, a veteran tree of landscape importance would be categorised as A2.

- 2.7 Details of the trees surveyed is included in Appendix A – Tree Survey Data.

3 The proposal

- 3.1 It is proposed to demolish the existing shed, including external turn table and build a new, larger steel framed (building) shed. The need to have a larger shed is to be able to accommodate the longer carriages.
- 3.2 The new shed base has been proposed to be a floating slab design to be raised 200mm from existing ground level and, as such, significant excavations are not expected for the construction of the new shed base.

4 Tree impact assessment

- 4.1 Trees adjacent to the development area, are unlikely to be adversely affected, provided that adequate precautions to protect the trees are implemented through the Arboricultural Method Statement outlined in section 5 of this report.
- 4.2 No CAVAT evaluation has been carried out as no trees have been identified for removal and mitigation will not be required.
- 4.3 The proposal has the potential to damage the following trees and groups:

Impact	Reason	Important/ High value A class Trees	Moderate Value B class Trees	Low Value C Class Trees	Trees for Removal / U class trees
Trees to be removed	To facilitate development	-	-	-	-
Retained trees that may be damaged through disturbance to RPAs	Removal of existing surfacing/ structures/ Landscaping/ Installation of new surfacing/ structures/ landscaping	T7-T9, T34 & T38	T35-T37	-	-
Retained trees to be pruned	Remediation of defects	T9 & T34	-	-	-

Impact Appraisal

- 4.4 Plans supplied by Track Systems UK, were used to ascertain the extents of the proposed development and its potential impact on the existing tree stock.
- 4.5 The minimum distances that excavations/soil level changes can be carried out adjacent to the trees surveyed have been calculated by measuring the DBH (diameter at breast height), the RPA (Root Protection Area) is worked out using the recognised method detailed within BS5837 2012.
- 4.6 Two trees (T9 and T34) have low branches which may be damaged during the development. Some minor protective pruning of these trees, to cut back low branches, has been recommended in order to prevent potential damage from the construction works. See tree schedule in Appendix A for recommendations.
- 4.7 It is considered likely that root growth under the existing shed will be restricted and the RPA of T8 in Appendix B has been offset to reflect this.
- 4.8 The site extents encroach into the RPA of trees T8 and T9 by 8.2% of the total area of the RPAs. This is not deemed to be significant considering the remaining good quality rooting medium available to the tree.
- 4.9 There is the potential for tree roots to be damaged during the proposed development. This could occur either through direct mechanical damage or through compaction from vehicles/plant or storage of materials. Damage can also occur through contamination from spillages from mixing areas.

- 4.10 Importantly, there have been confirmed cases of *Phytophthora pseudosyringae* from tests carried out in May 2017. This infection was deemed responsible for the decline of a number of alder trees in the freshwater area. Infected trees were removed in winter (2017), and again in 2018. Further removals of infected trees were also planned for later in 2018. This means that there is very likely to be *Phytophthora* pathogens in the soil, particularly adjacent to water courses in the freshwater area. Reasonable care should be taken not to spread the *Phytophthora* infection to other areas.

5 Arboricultural Method Statement

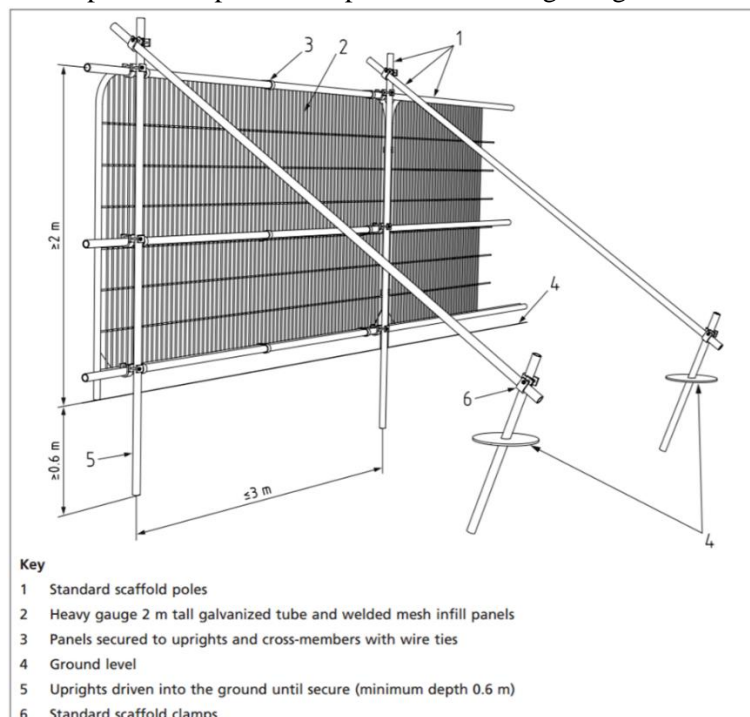
5.1 Summary of recommendations

- 5.1.1 All personnel working in the root protection areas (RPAs) will be properly briefed about their responsibilities towards important trees based on this guidance.
- 5.1.2 Care should be taken when carrying out any excavations, and in the removal of any existing buildings or surfaces, to ensure no significant roots are damaged. This includes by direct mechanical damage, or through compaction caused by plant movement, storage of materials, or contamination from spillages etc. during the building process.
- 5.1.3 Care should also be taken not to damage overhanging tree branches during the building process. Should it be required, minor branches should be sensitively pruned to standards set out in BS3998: 2010 Tree Work Recommendations to allow adequate space for the movement of plant. This sort of protective pruning would prevent direct damage/torn branches etc. which may cause long term health or structural problems with these trees.)
- 5.1.4 Protective pruning and other necessary protective measures should be installed prior to the commencement and maintained for the duration of any works.
- 5.1.5 During construction, if significant roots (>25mm) are uncovered during the development, advice should be sought from an appropriately qualified Arboriculturalist to identify any required management solutions.

5.2 Specific Protection Measures

- 5.2.1 As this is a high frequency footpath, it is advised that there be pedestrian access adjacent to the new shed. This is the area shown in orange in Appendix B and no works are to be carried out in this area.
- 5.2.2 Trees to be retained will require the installation of protective barriers, meeting best practice specifications for tree protection in order to protect the trees' root systems, as far as is practical, from being damaged by plant movement, storage of materials, spillages etc. during the building process. An example of an acceptable design is shown in Figure 1 at 5.2.6 of this section.

- 5.2.3 The recommended location of protective measures, are shown in the Tree Protection Plan in Appendix B.
- 5.2.4 In the event that tree roots are damaged by the development, exposed roots should be treated at once to avoid desiccation. Any roots smaller than 25mm in diameter, can be pruned back, preferably to a side branch, with suitable sharp pruning tools.
- 5.2.5 Arboricultural supervision will be required during the removal of the existing shed base, in order to identify the presence, if any, of any significant advantageous roots that may have utilised the space beneath the base. If roots are uncovered, an engineering solution should be sought in order to progress without damage to significant roots.
- 5.2.6 There should be a designated storage and mixing area to be located within the site compound, as identified by the blue area shown in Appendix B, to prevent the risk of tree roots being damaged from the storage of materials, spillages etc. during the building process.
- 5.2.7 It was not known if there will be a need for the installation of new service runs within the RPAs of any protected trees. Where possible, it is proposed that all new services, if any, are kept outside the RPAs. Trenchless excavations are preferred, but if that is not feasible then hand digging, per guidelines laid out in BS5837 2012. If services do need to be installed within the RPAs a method statement should be prepared and written approval obtained from the planning department before any works are carried out.
- 5.2.8 Because of the presence of Phytophthora pathogens in the area, reasonable care should be taken not to spread potentially infected material. Movement of soil around the site should be kept to a minimum and no soil or other potentially infected material should be removed from site.
- 5.2.9 Figure 1 - Example of acceptable tree protective fencing design:



Appendix A Tree Survey Data

Ref	Species	Measurements	Observations/Recommendations	Timescale/duration	Retention Category	RPA
T01	Alder (Alnus sp.)	Height (m): 9# Stem Diam (mm): 240, 270, 310, 270 Branch Spread (m): N:4, S:3 E:4, W:4 Physiological Cond: Fair Structural Cond: Good Bat Habitat: Medium	Multi-stemmed Growing on bank Ivy on stem Minor deadwood Install protective fencing	Prior to and for the duration of works	B1,2	Radius: 3.2 m. Area: 33.0 sq. m.
T02	Ash (Fraxinus sp.)	Height (m): 10# Stem Diam (mm): 320 Branch Spread (m): N:3, S:4, E:5, W:5 Physiological Cond: Fair Structural Cond: Good Bat Habitat: Medium	Group effect Ivy on stem Install protective fencing	Prior to and for the duration of works	B1	Radius: 3.8 m. Area: 46.3 sq. m.
T03	Oak (Quercus sp.)	Height (m): 11# Stem Diam (mm): 620 Branch Spread (m): N:8, S:4, E:8, W:5 Physiological Cond: Fair Structural Cond: Good Bat Habitat: Medium	Weighted to North Install protective fencing	Prior to and for the duration of works	A1	Radius: 7.4 m. Area: 173.9 sq. m.
T04	Ash (Fraxinus sp.)	Height (m): 12# Stem Diam (mm): 330 Branch Spread (m): N:3, S:3, E:3, W:3 Physiological Cond: Fair Structural Cond: Good Bat Habitat: Low	Minor deadwood Install protective fencing	Prior to and for the duration of works	A1	Radius: 4.0 m. Area: 49.3 sq. m.
T07	Ash (Fraxinus sp.)	Height (m): 17# Stem Diam (mm): 610 Branch Spread (m): N:5, S:5, E:6, W:5 Physiological Cond: Fair Structural Cond: Fair Bat Habitat: Low	Minor deadwood Install protective fencing	Prior to and for the duration of works	A1	Radius: 7.3 m. Area: 168.4 sq. m.

Appendix A Tree Survey Data

Ref	Species	Measurements	Observations/Recommendations	Timescale/duration	Retention Category	RPA
T08	Oak (Quercus sp.)	Height (m): 18# Stem Diam (mm): 1100 Branch Spread (m): N:6, S:8, E:7, W:8 Physiological Cond: Fair Structural Cond: Good Bat Habitat: Low	Truncated limb Install protective fencing	Prior to and for the duration of works	A1	Radius: 13.2 m. Area: 547.5 sq. m.
T09	Oak (Quercus sp.)	Height (m): 15# Stem Diam (mm): 590 Branch Spread (m): N:9, S:4, E:5, W:7 Physiological Cond: Fair Structural Cond: Good Bat Habitat: Low	Truncated limb Minor root damage Low branch over site compound Crown lift to 5m Install protective fencing	Prior to and for the duration of works	A1	Radius: 7.1 m. Area: 157.5 sq. m.
T34	Oak (Quercus sp.)	Height (m): 12# Stem Diam (mm): 620 Branch Spread (m): N:5, S:6, E:5, W:5 Physiological Cond: Fair Structural Cond: Medium Bat Habitat: Medium	Adjacent to compost area and lake Increase soil levels on south side of stem Low branch over site compound Crown lift to 5m Install protective fencing	Prior to commencement of works (CL) Prior to and for the duration of works	B2	Radius: 7.4 m. Area: 173.9 sq. m.
T35	Ash (Fraxinus sp.)	Height (m): 8# Stem Diam (mm): 260 Branch Spread (m): N:3, S:4, E:4, W:3 Physiological Cond: Fair Structural Cond: Good Bat Habitat: Low	Adjacent to compost area Increase in soil levels on south side of stem Install protective fencing	Prior to and for the duration of works	B2	Radius: 3.1 m. Area: 30.6 sq. m.
T36	Western red cedar (Thuja plicata)	Height (m): 7# Stem Diam (mm): 200 Branch Spread (m): N:2, S:2, E:2, W:2 Physiological Cond: Poor Structural Cond: Good Bat Habitat: Medium	Adjacent to compound entrance Thinning crown Install protective fencing	Prior to and for the duration of works	C2	Radius: 2.4 m. Area: 18.1 sq. m.

Appendix A Tree Survey Data

Ref	Species	Measurements	Observations/Recommendations	Timescale/duration	Retention Category	RPA
T37	Western red cedar (Thuja plicata)	Height (m): 7# Stem Diam (mm): 220 Branch Spread (m): N:2, S:2, E:2, W:2 Physiological Cond: Fair Structural Cond: Good Bat Habitat: Medium	Adjacent to compound entrance Install protective fencing	Prior to and for the duration of works	B2	Radius: 2.6 m. Area: 21.9 sq. m.
T38	Oak (Quercus sp.)	Height (m): 20# Stem Diam (mm): 700 Branch Spread (m): N:9, S:8, E:8, W:8 Physiological Cond: Fair Structural Cond: Good Bat Habitat: Low	Opposite compound entrance Install protective fencing	Prior to and for the duration of works	A1	Radius: 8.4 m. Area: 221.7 sq. m.

Appendix B SITE PLAN SHOWING TREE LOCATIONS, RPAs, and TREE PROTECTION MEASURES

