K.0170 | AIA TPP | MGP | 11.03.16

# PLANNING APPLICATION FOR A RENEWABLE ENERGY CENTRE AND INDUSTRIAL WAREHOUSE

## KEYPOINT 145, THORNHILL ROAD, SWINDON, WILTSHIRE, SN3 4RY

# ARBORICULTURAL SURVEY, IMPACT ASSESSMENT AND PROTECTION PLAN

### ON BEHALF OF ROLTON KILBRIDE

**BS5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION AND CONSTRUCTION – RECOMMENDATIONS'**

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PLANNING | DESIGN | ENVIRONMENT | ECONOMICS

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# 1. INTRODUCTION

1.1 Pegasus Group were instructed by Rolton Kilbride to carry out a tree survey of land at Keypoint 145, Thornhill Road, Swindon; herein referred to as the site.

1.2 The scope of the assessment was to visit the site and to survey relevant trees, hedges and shrub masses in accordance with BS5837:2012 '*Trees in relation to design, demolition and construction – recommendations*.' Pegasus Group was requested to then present the following information:

- Tree survey report;
- Schedule of tree survey data; and
- Updated topographical survey showing preliminary tree constraints.

1.3 With reference to the above information and BS 5837:2012, Pegasus Group was subsequently also instructed to assess the impact of development proposals on the site's arboricultural resource and to produce the following:

- Arboricultural Impact Assessment;
- Tree Retention/Removal and Protection Plan; and
- Heads of terms for an Arboricultural Method Statement.

## 2. REPORT LIMITATIONS

2.1 Trees are living organisms as well as self-supporting dynamic structures. Their physiological and structural condition can change rapidly in response to a wide range of biotic/abiotic factors. They have the potential to fail structurally, without prior manifestation of any reasonably observable symptoms. It is therefore not possible to categorically state that any tree is 'safe'.

2.2 This report is prepared for planning application purposes only and does not evaluate the degree of risk posed by trees.

2.3 It is beyond the scope of this report to comment in relation to structural damage – direct or indirect, existing or potential – that might be associated with vegetation growth, or vegetation-related soil subsidence or heave.

2.4 Any management recommendations set out within this report are of an advisory and preliminary nature only and relate to trees within the context of current site use. Any physical alterations to site conditions subsequent to the date of the site survey will have the potential to change/invalidate the findings and recommendations of this report.

2.5 The findings and recommendations of this report are limited to a period of 24 months from the date of this report.

## 3. DOCUMENTS AND INFORMATION PROVIDED

3.1 For the purposes of carrying out the assessment, Pegasus Group were provided with the following information:

- Topographical Survey, Brunel Surveys Ltd, Drawing 15971-500-01, November 2015.
- Site Layout Plan, Pegasus Group, drawing K.0170_01 Rev F, 10.02.16

## 4. OTHER CONSIDERATIONS

**Statutory tree protection**

4.1 Swindon Borough Council has confirmed (via email 27/01/2016) that the site is not located within a Conservation Area. It has confirmed that trees on the western boundary and north-western boundary of the site are subject to a Tree Preservation Order (TPO) reference BOT TPO (No.3) 1984.

4.2 Excluding specific exemptions (including the granting of full planning permission) it is an offence to carry out any works to any tree that is subject to a TPO without having first applied for and obtained the approval of the local planning authority.

4.3 On many sites (excluding specific exemptions) there is also a statutory restriction relating to tree felling that relates to quantities of timber that can be removed within set time periods. In basic terms, it is an offence to remove more than 5 cubic metres of timber in any one calendar quarter without having first obtained a felling licence from the Forestry Commission.

4.4 Any proposed tree works that are planned to be carried out on site must be carried out with a view to and in accordance with the statutory controls outlined above.

**Statutory Wildlife Protection**

4.5 Although preliminary visual checks from ground level of likely wildlife habitats are made at the time of surveying, detailed ecological assessments of wildlife habitats are not made by the arboriculturist and fall outside the remit of this report.

4.6 Trees which contain holes, splits, cracks and cavities could potentially provide a habitat for bats in addition to birds and small mammals. It is recommended that in line with any accompanying specialist advice, any tree works should only be carried out following a detailed climbing inspection to the tree to ensure that protected species or their nests/roosts are not disturbed. If any are found, the project manager, site owner or consulting arboriculturist should be informed and appropriate action taken as recommended by a Statutory Nature Conservation organisation such as Natural England.

4.7 It is advised that tree/hedgerow works are carried out with the understanding that birds will generally nest in trees, hedges and shrubs between March and

August. Ideally, operations should be avoided during this period. Any necessary work should only be carried out following a preliminary check of the vegetation.

4.8 For information, the Wildlife and Countryside Act 1981 (as amended), The Countryside and Rights of Way Act 2000 (as amended) and the Conservation of Habitat and Species Regulations 2010, form the basis of the statutory legislation for flora and fauna in Britain.

## 5. SURVEY METHODOLOGY

Site visit

5.1 Pegasus Group visited the site on the 18th February 2016. Individual present on site Michael Paginton TechArborA.

Tree Survey

5.2 The tree survey was carried out with reference to methodology set out in BS5837:2012 *'Trees in relation to design, demolition and construction – Recommendations'.* Trees were not tagged.

5.3 Trees were surveyed individually or as groups where it was considered that they had grown together to form cohesive arboricultural features either aerodynamically (trees that provide companion shelter), visually (e.g. avenues or screens) or culturally (including for biodiversity). However, where it was considered that there was an arboricultural need to differentiate between attributes trees within groups were also surveyed as individuals

5.4 Tree survey findings are recorded in the tree survey schedule (Appendix 2).

5.5 Within the tree survey schedule, each surveyed tree (T), and group (G), on or adjacent to the site is given a *reference number* which refers to its position on the tree survey plan (Appendix 3).

5.6 Also shown on the tree survey plan are quality grading and preliminary tree constraints: root protection areas (see paragraph 8.2 for definition).

5.7 *Tree species* are listed by common name.

5.8 *Heights* are measured in metres. They are recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.

5.9 *Trunk diameters* are measured in millimetres and are rounded to the nearest 10mm. Single stemmed tree diameters are measured at 1.5m above ground level or, where a fork or swelling makes this impractical, at the narrowest point beneath. Diameters of multi-stemmed trees are calculated as '*combined stem diameters*' according to specific guidance set out within BS5837:2012.

5.10 *Branch spreads* are taken at the four cardinal points to derive an accurate representation of the tree crown. They are recorded up to the nearest half metre

for dimensions up to 10m and to up the nearest whole metre for dimensions over 10m.

5.11 *Crown clearance* is expressed both as existing height above ground level of first significant branch along with its direction of growth (e.g. 2.5m-N), and also in terms of the overall canopy. Measurements are recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.

5.12 *Estimates.* Where any other measurement has had to be estimated, due to inaccessibility for example, this is indicated by a "#" suffix to the measurement as shown in the tree survey schedule.

5.13 *Life stage* is defined as Y – young (stake dependent), SM - Semi-Mature (still capable of being transplanted without preparation, up to 30cm girth and not yet sexually mature), EM – Early Mature (not yet having reached 75% of expected mature size), M – Mature (anything else up to normal life expectancy for the species), OM – Over Mature (anything beyond mature and in natural decline), V – Veteran (any tree displaying characteristics described by Natural England).

5.14 *General observations* are recorded in relation to a tree's structural and/or physiological condition (e.g. the presence of any decay and physical defect) and /or any preliminary management recommendations that may be appropriate.

5.15 *Physiological condition* is described as *Good* (no indications of impaired physiological function and in optimum condition for age and species), *Fair* (with indicators of reduced vitality. Some intervention may be required), *Poor* (with significantly impaired physiological function for age and species).

5.16 *Structural condition* is described as *Good* (without any observable significant biomechanical structural weaknesses), *Fair* (with minor biomechanical structural flaws. Some remedial action may be required), *Poor* (with significant biomechanical weaknesses requiring intervention particularly where risk management is required).

5.17 *Useful life expectancy*, or the length of time a tree's is estimated to be able to make a useful contribution, is expressed in years as: <10, 10+, 20+, 40+.

5.18 *Quality* of individual trees, groups of trees and woodlands is assessed in terms of quality and benefit within the context of proposed development and graded into one of four categories (A, B, C and U) which are differentiated on the tree survey (Appendix 3) plan by the colours indicated below:

| | |
|---|---|
| **Category A (Green)** | Trees of high quality with an estimated remaining life expectancy of 40 years |
| **Category B (Blue)** | Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. |
| **Category C (Grey)** | Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm. |
| **Category U (Red)** | Unsuitable for retention. Trees in such a poor condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years. |

5.19 A, B and C trees have also been given a sub-category of 1, 2 or 3 which reflects their arboricultural, landscape or cultural and conservation values respectively. Each subcategory has an equal weight, for example an A1 tree has the same retention priority as an A3 tree.

5.20 In addition to the category, the tree survey schedule also describes each tree's root protection area (RPA) in terms of radius (metres) and overall area (sq metres).

## 6. DESCRIPTION OF SITE AND TREES

6.1 The site is located on land at 145 Keypoint, Thornhill Road, Swindon. A site location plan is at Appendix 1.

- Post Code SN3 4RY
- Grid reference: SU 18563 86810

6.2 The site comprises an area of grassland broadly rectangular in shape. The interior of the site is void of woody vegetation, with trees and shrubs located on the field boundary.

6.3 The site is bounded to the east by a road that provides access to the Honda Manufacturing Plant. To the south there is a belt of early-mature to mature mixed broadleaf trees that separates the site from the Great Western Mainline. The northern boundary comprises a dense linear broadleaf group that separates the site from land within the Honda Manufacturing complex. To the west of the site are further grassland fields with mixed broadleaf trees on their boundary and the A419 beyond. Except for a large mature oak tree, the western site boundary is largely void of woody vegetation.

## 7. TREE SURVEY FINDINGS

7.1 A total of nine survey items (trees and groups) were assessed during the site visits. These are detailed within Appendix 2 and shown in Appendix 3. A summary of tree survey findings is shown in table form below:

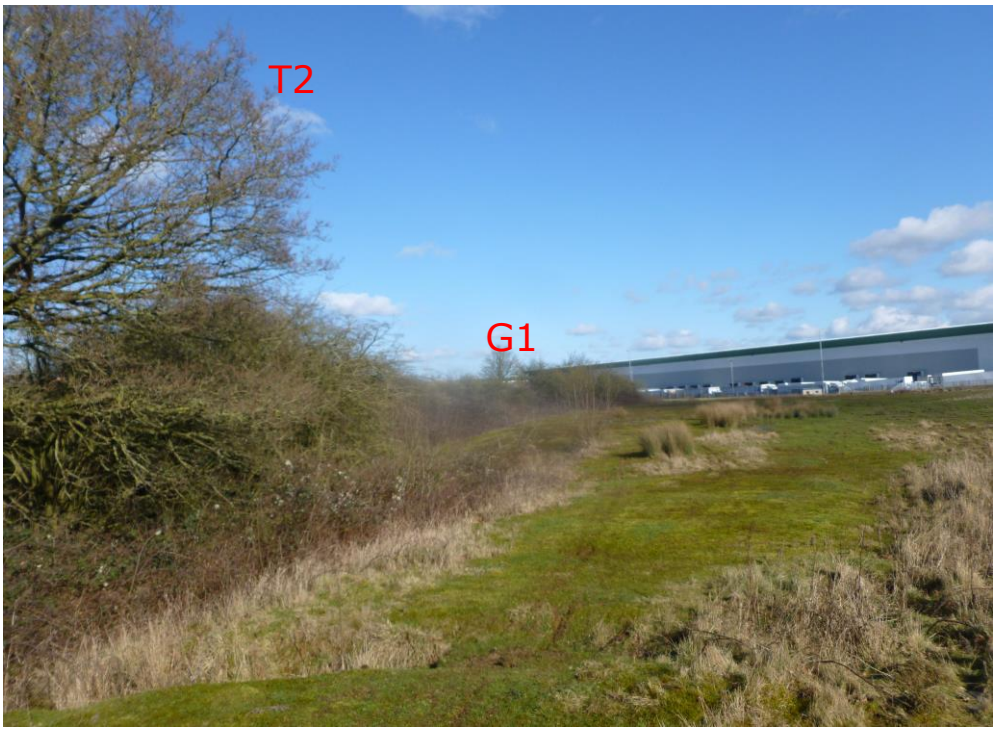
| | Total | A | B | C | U |
|---|---|---|---|---|---|
| Trees | 7 | 0 | 2 | 5 | 0 |
| Group | 2 | 0 | 1 | 1 | 0 |
| Total | 9 | 0 | 3 | 6 | 0 |

7.2 Six surveyed item was considered to be of low quality (Category C) with 10+ years useful life expectancy. A further three surveyed items were considered to be of moderate quality (Category B) within the region of 20+ years life expectancy.

7.3 No surveyed item was assessed to be in such a poor physiological or structural condition that they were considered unsuitable for retention within their current site context (Category U). However, it was noted that within G1 (western boundary) there is a dead oak tree, forming standing deadwood.

7.4 No surveyed items were considered to be of high quality (Category A) with a life expectancy in the region of 40+ years.

7.5 Selected photographs of the site are shown below:




*Photoview 1:* View looking north east along the northern boundary of the site. T2 (Cat B) is to the left of frame with G1 to front and distance.

*Photoview 2*: View looking west towards T7 (Cat B) located on the western boundary of the site.

*Photoview 3:* View looking west towards the dead oak tree set within the western part of G1.

*Photoview 4:* View south west along the southern boundary of the site towards G8 (Cat B).


*Photoview 5:* View looking east along the southern boundary where G8 (Cat C) gives way to a bramble shrub mass.

*Photoview 6:* View looking north along the eastern boundary of the site.

## 8. IDENTIFICATION OF PRELIMINARY TREE CONSTRAINTS

8.1 In accordance with BS5837:2012, below ground constraints, or root protection areas (RPAs), for the surveyed trees have been plotted onto the tree survey plan for the site. These are represented as a circle centred on the base of each tree stem with a radius of 12 times stem diameter measured at 1.5m above ground level.

8.2 With reference to BS5837:2012, a root protection area (RPA) is defined 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 should be treated as a priority*". "*The default position [when considering design layout in relation to RPAs] should be that structures are located outside the RPAs of trees to be retained*".

8.3 BS5837:2012 states (4.6.2) that, "*where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced.*" The BS goes on to state that, "*modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution,*" and that any deviation from the original circular plot should take into account:

- morphology and disposition of roots;
- topography and drainage;
- soil type and structure;
- the likely tolerance of the tree to root damage/disturbance.

8.4 Root systems can be damaged in a number of ways as follows:

- Severance of a root will destroy all parts of the root beyond that point. The larger the root severed, the greater the impact on the tree. If roots are damaged close to the trunk, the anchorage and stability of the tree can be affected.
- The root bark protects the root from decay and is also essential for further root growth. If damage to the bark extends around the whole circumference, the root beyond that point will be killed.

- Soil compaction, which may occur from storage of material or passage of heavy equipment over the root area, can restrict and even prevent gaseous diffusion through the soil, and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.
- Lowering the soil level will strip out the mass of roots near the surface.
- Raising soil levels will have the same effect as soil compaction.
- Incorrect selection and application of herbicide.
- Spillage of oils or other harmful materials.

8.5 Above ground constraints posed by trees describe the capacity for trees to have an overbearing or dominating effect on new developments. Typical above ground constraints include a number or combination of inconveniences including shading, branch spread, movement of trees during strong winds and so on. If not adequately considered, above ground constraints can lead to repeated requests to fell or heavily prune retained and protected trees.

8.6 The colour-coded categorisation of tree quality is also shown on the tree survey plan.

## 9. DESCRIPTION OF PROPOSED DEVELOPMENT

9.1 The Proposed Development will be comprised by the following elements:

- Construction and operation of a 3-line Renewable Energy Centre (REC) (use class Sui Generis) on the northern part of the Application Site which will employ an Advanced Conversion Technology (ACT) called gasification;
- Associated plant and infrastructure, i.e. water tanks and pump room, turbine room, external plant (e.g. stack, ash bunker, filter dust silos, flue gas filters, lime silos, carbon silo), weighbridge, gate house, service areas, staff and visitor car parking and cycle stands, vehicle barriers and removable bollards, fencing and lighting etc. necessary for the operation of the Renewable Energy Centre;
- Construction and operation of a 30,000ft2 industrial warehouse building (use class B8) on the southern part of the Application Site;
- Associated plant and infrastructure, i.e. gate house, service areas, staff and visitor car parking and cycle stands, vehicle barriers, fencing and lighting etc. necessary for the operation of the industrial warehouse;
- Construction of a new vehicular access to Thornhill Road; and
- Landscaping proposals to enhance the existing environment.

9.2 Proposal are shown on the Tree Retention/Removal and Protection Plan in Appendix 5.

## 10. ARBORICULTURAL IMPACT ASSESSMENT (AIA)

10.1 With reference to BS5837:2012 *'Trees in relation to design, demolition and construction'*, this AIA evaluates the potential direct and indirect effects of the proposed parameters plan on the site's arboricultural resource.

10.2 The AIA considers the effects of potential tree loss required to implement proposals as well as any potentially damaging activities proposed in the vicinity of retained trees. BS5837:2012 suggests that such activities might include:

- Removal of existing structures and hard surfacing;
- Installation of new hard surfacing;
- Installation of services;
- Location and dimensions of all proposed excavations and changes in ground level (including those that might arise from the implementation of recommended mitigation measures); and
- The 'buildability' of the scheme in terms of access, adequate working space, provision for storage of materials including topsoil.

10.3 With reference to BS5837:2012, the AIA includes the following information:

- Tree Retention/Removal and Protection Plan (Appendix 5); and
- a description of the potential impact of proposals (Appendix 4 and 10.6-10.18 below).

10.4 An arboricultural impacts assessment schedule is included at Appendix 4. This provides a tree-by-tree assessment of the potential impacts of the proposals. It also evaluates the degree of impact and sets out mitigation measures as may be necessary. This overall assessment is expanded on below:

10.5 The table below summarises the tree retention and loss across the site:

| TREES/Groups | Total | Number loss | Number partially removed | Number retained |
|---|---|---|---|---|
| Category A | 0 | 0 | 0 | 0 |
| Category B | 3 | 0 | 0 | 3 |
| Category C | 6 | 0 | 1 | 5 |
| Category U | 0 | 0 | 0 | 0 |
| **Total** | **9** | **0** | **1** | **8** |

10.6 The above table shows that proposals have the potential to retain all surveyed items.

10.7 Only once item, G1, will require partial removal as part of proposals. G1 is located on the northern and north-western boundary of the site. Part of the northern section, which comprises largely of elm, hawthorn and blackthorn, will require removal.

10.8 It is considered that tree planting as part of landscaping proposals will provide suitable mitigation for the partial loss of G1.

Tree works

10.9 No major tree works are anticipated in relation to proposals.

Removal of hard surfacing and existing structures

10.10 No existing hard surfacing nor hard standing will be removed from within the RPAs of any retained survey item.

Installation of hard surfacing

10.11 Soil compaction reduces soil aeration and penetrability thereby impeding tree root growth and respiration capacity. The consequences of soil compaction often manifest themselves in trees as symptoms of reduced physiological function; dieback at branch and root extremities and thinned density of foliage. In turn, the effects of these symptoms can lead to overall decline and/or reduced resistance to pests and diseases.

10.12 No hard standing or surfacing will be constructed within the RPAs of any retained items except for a footpath within the RPA of T7. Footpath construction has the potential to cause localised soil compaction and some rot damage/severance. To avoid/reduce these potential impacts it is recommended that the footpath should be constructed using an above ground cellular conferment system in accordance with an arboricultural method statement.

Installation of services.

10.13 No services are proposed within the RPA of any retained items.

Excavations

10.14 No Excavations will occur within the RPA of retained trees.

Overbearing effects

10.15 No overbearing impacts are envisaged in relation to proposals.

Levels

10.16 No changes to ground levels are proposed in relation to any surveyed item.

'Buildability'

10.17 It is considered that there is sufficient space within the site to accommodate the storage of materials, and construction equipment/vehicles etc. without impacting on any surveyed item.

Tree Planting

10.18 Proposals include new areas of tree planting around the site as part of the landscaping. New tree planting has the potential to lead to a net increase in terms of tree numbers and diversity on site compared to the current

arboricultural resource. It is considered that proposals will lead to a net benefit from an arboricultural perspective when comparing potential loss/impacts with new planting.

## 11. TREE RETENTION AND PROTECTION PLAN

11.1 A Tree Retention/Removal and Protection Plan is attached.

**APPENDIX 5 – TREE RETENTION/REMOVAL AND PROTECTION PLAN**

11.2 Given that all surveyed items are located off site or on the boundary of the site the protection of trees is considered to be straight forward. Temporary tree protection fencing to BS.5837:2012 should be installed as shown on the Tree Retention/Removal and Protection Plan in order to deter potential encroachment of construction activities. Footpath installation in relation to T7 should adopt a "no dig" methodology to limited potential soil compaction and root damage.

11.3 The TPP demonstrates the feasibility of protecting trees during construction.

## 12. HEADS OF TERMS FOR AN ARBORICULTURAL METHOD STATEMENT

12.1 BS5837:2012 (Figure 1) recommends that detailed/technical design of tree protection and arboricultural methodologies should be resolved and finalised following on from the approval of the feasibility of a scheme by the relevant regulatory body.

12.2 Annex B and Table B.1 of BS5837:2012, an informative, advises that arboricultural method statement heads of terms are a sufficient level of information in order to deliver tree-related information into the planning system. The table also advises that a detailed arboricultural method statement might reasonably be required as a 'reserved matter' or planning condition.

12.3 In relation to the above site, it is anticipated that arboricultural working methods are likely to be quite straightforward. A draft, 'heads of terms' is set out below:

- Pre commencement site meeting;
- Partial removal of G1;
- Erection of temporary tree protection barriers;
- Main construction phase
- Move temporary tree protection fencing to secondary location in relation to T7;
- Construction of no dig footpath
- Removal of temporary tree protection;
- Final landscaping.

## 13. SUMMARY

13.1 The site is located on land at 145 Keypoint, Thornhill Road, Swindon. The site comprises an area of grassland broadly rectangular in shape. The internal of the site is void of woody vegetation, with trees and shrubs located on the field boundary.

13.2 Six surveyed item was considered to be of low quality (Category C) with 10+ years useful life expectancy. A further three surveyed items were considered to be of moderate quality (Category B) within the region of 20+ years life expectancy.

13.3 No surveyed item was assessed to be in such a poor physiological or structural condition that they were considered unsuitable for retention within their current site context (Category U). However, it was noted that within G1 (western boundary) there is a dead oak tree, forming standing deadwood.

13.4 No surveyed items were considered to be of high quality (Category A) with a life expectancy in the region of 40+ years.

13.5 Proposals will retain the majority of survey items. One surveyed item, G1, will require partial removal along the northern boundary to facilitate proposals. This removal will be mitigated through extensive tree planting within the site which will lead to a net increase in tree species and numbers resulting in a net benefit from an arboricultural perspective. No significant impacts are envisaged in relation to proposals, given that all surveyed items are located at field boundaries.

13.6 Temporary tree protection fencing will provide the main method of tree protection on site. A no dig method of footpath construction should be adopted within the RPA of T7.

13.7 Provided that recommendations and protection measures set out within this report are followed it is reasonable to conclude that proposals would be acceptable from an arboricultural perspective.

# APPENDIX 1

# SITE LOCATION PLAN