Arboricultural Survey

Broadland Gate,
Postwick Interchange,
Postwick,
Norfolk.

17th November 2016

PJC ref: 3348AO/16/01
This report has been prepared by
PJC Consultancy Ltd
on behalf of
Monte Blackburn Ltd & Pigeon Investments Ltd

<table>
<thead>
<tr>
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<th>Luke White FdSc Arboriculture M.Arbor.A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Luke is an arboriculturist with over five years experience working within the arboricultural and forestry industry with the latter three years working within consultancy. He gained a foundation degree in arboriculture with distinction from the University of Brighton in 2012 and is a professional member of the Arboricultural Association.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Checked by</th>
<th>Pete Davies FdSc Arboriculture M.Arbor.A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pete has a Foundation Degree in Arboriculture and is a professional member of the Arboricultural Association. He has nine years experience in the arboricultural industry, originally working as a grounds man and feller, and progressing into consultancy.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approved by</th>
<th>Nick Betts HND For M.Arbor.A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nick has attained an HND in forestry management and is a professional member of both the Arboricultural Association and the Consulting Arborists Society. He has worked in the arboricultural and forestry industries for 14 years. He started his career as a forestry worker before qualifying as a tree surgeon, working in both the private and commercial sectors. He has been a practising consultant since 2004.</td>
</tr>
</tbody>
</table>
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1 INTRODUCTION

1.1 Instruction: PJC Consultancy has been instructed by Monte Blackburn Ltd & Pigeon Investments Ltd to provide an arboricultural survey of land referred to as Broadland Gate located adjacent to Postwick Interchange, Norwich.

1.2 Brief: PJC Consultancy has been commissioned to undertake an initial arboricultural survey following the guidelines set out in BS5837: 2012 ‘Trees in relation to design, demolition and construction – Recommendations’.

1.3 Scope of this report: This report is concerned with all significant trees located within the property boundaries of the site. Additionally, trees located around the curtilage of the site have also been surveyed when they are considered likely to have the potential to impact on the development (in relation to root and crown protection or foundation design).

1.4 Purpose of report: This survey has been undertaken to record the condition and value of all significant trees at the site as well as the material constraints they pose on the development. The information in this report should be used to guide the design proposals.

1.5 Documents and information provided: The following documents were provided by the client to produce this report:

- Topographical Site Survey
- Site Location Plan
2 SITE VISIT AND SURVEY METHODOLOGY

2.1 Site visit: A site visit was carried out on Wednesday 16th November 2016. The weather conditions at the time were clear with light wind and the visibility was good.

2.2 Tree information: The following measurements and information were recorded in the Tree Survey Schedule for each individual tree (average dimensions are recorded for groups):

- Tree reference number. (T=tree, G=group, H=hedgerow, W=woodland block). Tree numbers suffixed with PA on the Tree Constraints Plan indicate the trees location was not included on the site plan provided so the tree’s position was approximated on site.
- Species (common and scientific name).
- Overall tree height (m).
- Stem diameter (mm) per stem or average diameter for multi-stemmed trees with six or more stems.
- Branch spread (m) measured to the four cardinal points.
- Existing height (m) above ground level of lowest significant branch and direction of growth.
- Existing height (m) above ground level of canopy.
- Age class (young, semi mature, early mature, mature, over mature or veteran).
- Physiological condition (good, fair, poor).
- Structural condition (good, fair, poor).
- Comments (general description of tree including any notable features).
- Preliminary management recommendations (prescriptions for tree management processes based on the current land use and not related to the proposed development).
- Tree categorisation (see below).
- Root protection area (m²).
- Root protection radius (m).

2.3 Tree categorisation: The condition and value of each tree was evaluated based on the current land use. Each tree or tree group has been awarded either category A, B, C or U and a sub category of either 1, 2 or 3 or a combination of the sub categories.

2.4 Tree categorisation summary:

- A – Trees of good condition or high value, with a predicted life span in excess of forty years.
- B – Trees of moderate condition or value, with a predicted life span in excess of twenty years.
- C – Trees of poor condition or low value, with a predicted life span in excess of ten years.
- U – Trees of such impaired condition that they cannot realistically be retained as living trees in the context of the current land use for more than ten years.
2.5 Tree sub categorisation summary:
• 1 – Trees have mainly arboricultural value, e.g. trees of good condition, form and vitality or rare tree species.
• 2 – Trees have mainly landscape value, e.g. trees of landscape prominence or that serve to screen unsightly views.
• 3 – Trees with mainly cultural value including conservation, e.g. commemorative trees, trees of historical significance, trees of ecological significance or veteran trees.

2.6 Each tree can only be categorised as A, B or C but may comply with more than one sub category. A Cascade chart further explaining how tree categorisation is decided is included in Appendix 3.

2.7 Root protection areas: Each tree’s stem diameter was recorded, and applied to the formula found in Appendix 4 to establish its root protection area. A root protection area represents a calculation of the minimum area of root growth required to support the tree, not the total rooting area.

2.8 The root protection areas are plotted on to the Tree Constraints Plan in Appendix 1, and recorded in the Tree Survey Schedule in Appendix 2. These are represented as a circle on the plan (unless significant rooting constraints are present), and are colour coded depending on the category the tree has been awarded. Where existing site conditions/ features are present that are deemed likely to have affected the root morphology, the root protection areas have represented as a polygon of equivalent size.

2.9 The disturbance of a tree’s root system can result in crown dieback and even death of the tree. Roots are used to support the tree structurally and act as transport for water and nutrients. Direct damage such as root severance can lead to ill health, as can compaction of the soil by construction traffic, heavy plant and storage of materials. Changing the nature of the surface above growing medium, i.e. from porous to non-porous can alter the resources available to the tree, which in turn can lead to its decline.

2.10 The root protection areas must be left free from excavation and disturbance, and protected from compaction or contamination during any proposed works. The majority of root growth is usually found within the top meter of soil. As such, even shallow disturbance within root protection areas can potentially have a significant impact on the trees.

2.11 Limitations of site visit: The survey methodology was restricted to a visual tree assessment from ground level. No tree climbing or ground investigation was carried out for this report. Where existing site constraints are present such as ivy covered trees, a very dense under-storey, or where trees are located on third party land to which access was not granted, tree dimensions were estimated by eye as accurately as possible.
3 SITE DETAILS AND SURVEY FINDINGS

3.1 Site location: The site is situated to the south of Yarmouth Road (A27) and east of the recently constructed Postwick Interchange, more broadly approximately 6km east of Norwich city within the county of Norfolk. The site has a central OS grid reference of TG 29166 08473. The surrounding land use is comprised of arable land to the north, south and east with commercial properties to the west. The site is boarded on all sides by highways. The location of the site within its environs is shown in figure 1. Please note that figure 1 is the most up to date aerial imagery available at the time of this report. Recent highways infrastructure works has occurred to the west and south of the site.

3.2 Site layout: The site is formed of two fields separated by a linear group of trees and one native species hedgerow. The western field was previously utilised as a site compound during the recent highways works and is comprised of hard standing with a recently constructed balancing pond. The eastern field comprises of unmaintained grassland with dense scrub around its boarders.

3.3 Brief landscape appraisal: Turkey oak T8 and pedunculate oak T10 and T11 have significant presence within the local landscape and are visible from the adjacent highway. Pedunculate oak T10 was once part of adjacent field boundary. The recent infrastructure works have incorporated the large tree within the centre of a new roundabout. Subsequently the tree is a key focal point for the travelling public. Linear tree group G1 and G3 are situated on the highway embankment forming the sites northern boundary. The two groups provide the site visual and acoustic suppression from the adjacent busy highway.
3.4 **Statutory tree protection:** North Norfolk District Council Tree Officer was not available at the time of this report to comment on the presence of a Tree Preservation Order within the site. However, the site is not within a conservation area. Any persons proposing to undertake tree works must check the status of these trees with the local authority, and gain necessary consent before works are undertaken.

3.5 Financial penalties and/or criminal proceedings can result if tree works are carried out on a protected tree without consent. The entirety of the tree is protected, both above and below ground.

3.6 **Tree categorisation summary:** A total of eleven individual trees, three tree groups and one hedgerow were surveyed and recorded in the Tree Survey Schedule. Three individual trees were categorised as A due to their high arboricultural and landscape merits. Two individual trees were categorised as B and six individual trees, three tree groups and one hedgerow were categorised as C.

<table>
<thead>
<tr>
<th>Categorisation</th>
<th>Individual tree</th>
<th>Tree group</th>
<th>Hedgerow</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>U</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>3</td>
<td>1</td>
<td>15</td>
</tr>
</tbody>
</table>

3.7 Detailed information for each tree can be viewed in the Tree Survey Schedule in Appendix 2.
4 CONCLUSIONS

4.1 To comply with BS5837: 2012, it is recommended that an arboricultural impact assessment be produced when the proposed layout has been finalised. The arboricultural impact assessment should include a schedule of trees to be retained and removed, evaluate the likely effects of construction works on retained trees including post development pressures and provide recommendations on mitigation measures to be implemented. It should also include a preliminary Tree Protection Plan.

4.2 As far as possible new buildings and areas of hard surfacing should be located outside of the root protection areas of retained trees. In certain situations, engineered solutions are available to allow construction within the root protection areas. Further input from an arboriculturist should be sought regarding their site-specific viability before these methods are relied upon.

4.3 Over-shading of gardens and dwellings for prolonged periods, nuisance caused by leaf/fruit drop or honeydew drip (particularly onto footpaths, parking areas or roof guttering) and an over-bearing presence of large trees can result in significant pressure from future occupants to carry out harsh remedial pruning works or to remove trees post development. All of these factors should be considered at the design stage.

4.4 Allowance should be made for future canopy growth of both existing and newly planted trees. Trees growing in areas of limited space may require regular future pruning works. The suitability of different species for regular crown reductions, the affect on their amenity value and the cost of future tree works should be considered.

4.5 The final design should show service locations and their routing. New utilities should be located outside of the trees root protection areas where they are underground and outside of the anticipated area of mature crown spread where above ground. If this is not possible, recommendations outlined in NJUG10 ‘Guidelines for the planning, installation and maintenance of utilities in proximity to trees’ should be followed. Advice should also be sought from the project arboriculturist.

4.6 Due to the frequency of trees located throughout the site, it is highly likely that tree removal will be required to facilitate redevelopment. Where tree removal is necessary to facilitate the wider regeneration benefits associated with development, a tree replacement strategy could be implemented to mitigate tree loss. If further tree planting does occur, consideration should be given to species selection (in relation to form and potential size) and planting locations to ensure their successful integration into the new development.
5 OTHER CONSIDERATIONS

5.1 Trees should be checked for protected species before works are undertaken. It is against the law to disturb bats or their roosts under the Conservation of Habitats and Species Regulations. Nesting birds are protected by the Wildlife and Countryside Act. If protected species are discovered, Natural England should be contacted for advice.

5.2 The tree works contractors should carry out all tree works to BS3998: 2010 ‘Tree works – recommendations’, as modified by research that is more recent. They should also carry relevant, adequate and up to date insurance.

5.3 It is also recommended that all tree works be carried out by an Arboricultural Association approved contractor. Approved contractors are expected to work to industry best standards, and the Arboricultural Association website contains contact details and information on engaging a suitable contractor.

5.4 The trees at this site were assessed for their condition and safety in relation to the average range of weather conditions that the region experiences. Any weather events that exceed the average norm cannot be predicted, and so their effects are not considered within this report.

5.5 The views and opinions contained within this report are entirely those of the author.
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Author: Luke White

Date: Thursday 17th November 2016
APPENDIX 1
Tree Constraints Plan
* Tree categorised in accordance with BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'.

Appendix 2. (Tree Survey Schedule) contained within the arboricultural report ref no. PJCG344549/16/01 contains further information for each tree.

This drawing should be viewed in colour.
Key:

- RPA for CAT A Tree*
- RPA for CAT B Tree**
- RPA for CAT C Tree***
- RPA for CAT U Tree****
- Tree canopy
- Tree group canopy

* Tree categorised in accordance with BS 5837:2012 ‘Trees in relation to design, demolition and construction - Recommendations’.

Appendix 2. (Tree Survey Schedule) contained within the arboricultural report ref. no. PJC334AO/16/01 contains further information for each tree.

This drawing should be viewed in colour.
This drawing should be viewed in colour.
APPENDIX 2
Tree Survey Schedule
# Tree Survey Schedule

**Client:** Monte Blackburn Ltd & Pigeon Investments Ltd  
**Site:** Broadland Gate, Postwick Interchange, Norwich  
**Survey date:** Wednesday 16th November 2016  
**Surveyor:** Luke White  
**PA:** Position approximate

<table>
<thead>
<tr>
<th>Tree ref. no.</th>
<th>Species</th>
<th>Height (m)</th>
<th>Stem diameter (mm)</th>
<th>Branch spread (m)</th>
<th>Crown clearance (m)</th>
<th>Age class</th>
<th>Physiological condition</th>
<th>Structural condition</th>
<th>Comments and preliminary management recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>ash pedunculate oak (Quercus robur)</td>
<td>7</td>
<td>300</td>
<td>N: 3</td>
<td>E: 4</td>
<td>S: 4</td>
<td>W: 4</td>
<td>Crown: 0.5 AV</td>
<td>Early mature</td>
</tr>
<tr>
<td>T1</td>
<td>hawthorn (Crataegus monogyna)</td>
<td>5</td>
<td>260</td>
<td>N: 2</td>
<td>E: 2</td>
<td>S: 2</td>
<td>W: 2</td>
<td>Crown: 0 AV</td>
<td>Mature</td>
</tr>
<tr>
<td>H1</td>
<td>hawthorn (Crataegus monogyna)</td>
<td>3</td>
<td>130</td>
<td>N: 2</td>
<td>E: 2</td>
<td>S: 2</td>
<td>W: 2</td>
<td>Crown: 0 AV</td>
<td>Mature</td>
</tr>
<tr>
<td>T3</td>
<td>ash pedunculate oak (Quercus robur)</td>
<td>3</td>
<td>120</td>
<td>N: 3</td>
<td>E: 2</td>
<td>S: 1</td>
<td>W: 2</td>
<td>Crown: 0.5 West</td>
<td>Semi mature</td>
</tr>
</tbody>
</table>

**Tree Survey Schedule Sheet 1**

**Root Protection Area (m²):**

<table>
<thead>
<tr>
<th>Category grading</th>
<th>Root Protection Area (m²)</th>
<th>Root Protection Radius (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1+2</td>
<td>13.9</td>
<td>2.1</td>
</tr>
<tr>
<td>B1+2</td>
<td>87.7</td>
<td>5.3</td>
</tr>
<tr>
<td>C1</td>
<td>4.5</td>
<td>1.2</td>
</tr>
<tr>
<td>C1</td>
<td>8.9</td>
<td>1.7</td>
</tr>
<tr>
<td>C1</td>
<td>14.7</td>
<td>2.2</td>
</tr>
</tbody>
</table>
# Tree Survey Schedule

<table>
<thead>
<tr>
<th>Tree ref. no.</th>
<th>Species</th>
<th>Height (m)</th>
<th>Stem diameter (mm)</th>
<th>Branch spread (m)</th>
<th>Crown clearance (m)</th>
<th>Age class</th>
<th>Physiological condition</th>
<th>Structural condition</th>
<th>Comments and preliminary management recommendations</th>
<th>Category grading</th>
<th>Root Protection Area (m²)</th>
<th>Root Protection Radius (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T5</td>
<td>ash (<em>Fraxinus excelsior</em>)</td>
<td>8</td>
<td>291 MS</td>
<td>N: 3 E: 3 S: 2 W: 2</td>
<td>Crown: 1.5 AV Branch: 2 AV</td>
<td>Mature</td>
<td>Good</td>
<td>Fair</td>
<td>Multiple co-dominant stems arising from well formed union at ground level. Upright crown growth habit. No remedial works required at time of survey.</td>
<td>C1</td>
<td>38.4</td>
<td>3.5</td>
</tr>
<tr>
<td>T6</td>
<td>ash (<em>Fraxinus excelsior</em>)</td>
<td>7</td>
<td>330</td>
<td>N: 3 E: 4 S: 3 W: 3</td>
<td>Crown: 1 East Branch: 2.5 AV</td>
<td>Mature</td>
<td>Poor</td>
<td>Fair</td>
<td>Single stem specimen with well formed crown structure. Significant dieback of crown evident. Significant deadwood within crown. Remove deadwood if land use changes.</td>
<td>C1</td>
<td>49.3</td>
<td>4.0</td>
</tr>
<tr>
<td>T7</td>
<td>beech (<em>Fagus sylvatica</em>)</td>
<td>11</td>
<td>430</td>
<td>N: 4 E: 5 S: 4 W: 3</td>
<td>Crown: 1.5 West Branch: 2 AV</td>
<td>Mature</td>
<td>Good</td>
<td>Good</td>
<td>Single stem specimen with well formed crown structure. Visible from adjacent highway. No remedial works required at time of survey.</td>
<td>B1+2</td>
<td>83.8</td>
<td>5.2</td>
</tr>
<tr>
<td>G3</td>
<td>silver birch field maple mixed native species</td>
<td>4 AV</td>
<td>80 AV</td>
<td>N: 1.5 E: 1.5 S: 1.5 W: 1.5</td>
<td>Crown: 0 AV Branch: 0 AV</td>
<td>Semi mature</td>
<td>Good</td>
<td>Good</td>
<td>Linear group with sporadic gaps. Typical highways embankment planting. Well formed crowns. Provides screening. No remedial works required at time of survey.</td>
<td>C1+2</td>
<td>2.9</td>
<td>1.0</td>
</tr>
<tr>
<td>T8</td>
<td>Turkey oak (<em>Quercus cenis</em>)</td>
<td>14</td>
<td>490</td>
<td>N: 5 E: 5 S: 5 W: 5</td>
<td>Crown: 0.5 North Branch: 2 AV</td>
<td>Mature</td>
<td>Good</td>
<td>Good</td>
<td>Single stem specimen with well formed crown structure. Significant landscape presence. No remedial works required at time of survey.</td>
<td>A1+2</td>
<td>108.8</td>
<td>5.9</td>
</tr>
</tbody>
</table>

**Client:** Monte Blackburn Ltd & Pigeon Investments Ltd  
**Site:** Broadland Gate, Postwick Interchange, Norwich  
**Survey date:** Wednesday 16th November 2016  
**Surveyor:** Luke White  
**MS:** Multiple stems  
**AV:** Average  
**PA:** Position approximate  

T: Individual tree or shrub  
G: Group of 2 or more trees  
H: Hedgerow  
W: Woodland block
<table>
<thead>
<tr>
<th>Tree ref. no.</th>
<th>Species</th>
<th>Height (m)</th>
<th>Stem diameter (mm)</th>
<th>Branch spread (m)</th>
<th>Crown clearance (m)</th>
<th>Age class</th>
<th>Physiological condition</th>
<th>Structural condition</th>
<th>Comments and preliminary management recommendations</th>
<th>Category grading</th>
<th>Root Protection Area (m²)</th>
<th>Root Protection Radius (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T9</td>
<td>sycamore (Acer pseudoplatanus)</td>
<td>12</td>
<td>422</td>
<td>MS</td>
<td>N: 2 E: 5 S: 5 W: 5</td>
<td>Mature</td>
<td>Fair</td>
<td>Fair</td>
<td>Multiple co-dominant stems arising from compressed union at ground level. Crown suppressed north due to proximity of T8. No remedial works required at time of survey.</td>
<td>C1+2</td>
<td>80.7</td>
<td>5.1</td>
</tr>
<tr>
<td>T10</td>
<td>pedunculate oak (Quercus robur)</td>
<td>12</td>
<td>940</td>
<td>MS</td>
<td>N: 6.5 E: 6.5 S: 6.5 W: 6.5</td>
<td>Mature</td>
<td>Good</td>
<td>Good</td>
<td>Single stem specimen with well formed and well balanced crown structure. Significant landscape presence. No remedial works required at time of survey.</td>
<td>A1+2</td>
<td>400.3</td>
<td>11.3</td>
</tr>
<tr>
<td>T11</td>
<td>pedunculate oak (Quercus robur)</td>
<td>16</td>
<td>1050</td>
<td>MS</td>
<td>N: 7 E: 7 S: 7 W: 7</td>
<td>Mature</td>
<td>Good</td>
<td>Good</td>
<td>Single stem specimen with well formed and well balanced crown structure. Significant landscape presence. No remedial works required at time of survey.</td>
<td>A1+2</td>
<td>499.4</td>
<td>12.6</td>
</tr>
</tbody>
</table>
APPENDIX 3
Cascade Chart for Tree Quality Assessment
### Cascade chart for tree quality assessment

<table>
<thead>
<tr>
<th>Category and definition</th>
<th>Criteria (including subcategories where appropriate)</th>
<th>Identification on plan</th>
</tr>
</thead>
</table>
| **Trees unsuitable for retention** | **Category U**  
Those in such a condition that they cannot realistically be retained as living trees in the context of their current land use for longer than 10 years  
- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after the removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)  
- Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline  
- Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality  
*Note Category U trees can have existing or potential conservation value which it might be desirable to preserve* | Red |

| **Trees to be considered for retention** | **Category A**  
Trees of high quality with an estimated remaining life expectancy of at least 40 years  
- Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi—formal arboricultural features (e.g. the dominant and/or principal trees within an avenue) | Green |

| **Category B**  
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years  
- Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remedial defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation | Blue |

| **Category C**  
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm  
- Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories | Grey |
APPENDIX 4
Root Protection Area Formulas

CALCULATING THE RPA

For single stemmed trees

\[ RPA(m^2) = \frac{(\text{stem diameter (mm) @ 1.5 m x 12})^2 \times 3.142}{1000} \]

For trees with two to five stems, a combined stem diameter is calculated as follows:

\[ \sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \ldots + (\text{stem diameter 5})^2}\]

For trees with more than five stems, the combine stem diameter is calculated as follows:

\[ \sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}\]
Photograph 1 – Linear tree group G1 forming the sites north west boundary.

Photograph 2 – Linear group of trees situated centrally within the site.
Photograph 3 – Category A oak T11 located close to the sites southern extent.

Photograph 4 – Category A oak T10 situated within the new roundabout on the sites southern extent.