CAMBRIDGE SCIENCE PARK STATION AND INTERCHANGE

TREE SURVEY REPORT

JUNE 2013
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1.0 INTRODUCTION

The Tree Survey report has been prepared for the proposed Development of Cambridge Science Park Station and Interchange, located within the Chesterton Sidings of Cambridge's northern fringe. The report is in accordance with Cambridgeshire County Council's local validation requirements and relevant policies and guidance.

The scope of this report is to provide supporting information with regards to the application and should be read in conjunction with the Ecology Chapter 6 and Landscape & Visual Chapter 9 of the associated Environmental Statement (ES). The provisions of the Construction Environmental Management Plan (CEMP) and draft Environmental Management Plan (EMP) which in addition to the design process, have sought to maximise existing landscape features within the Site (minimising loss of existing vegetation wherever possible), to ensure that retained trees are protected during the construction process and appropriately managed as part of the future maintenance of the Development.

The purpose of this report within the application is as follows:

- identify the location and character of trees within the Site and those within influencing distance of the Site;
- inform the CEMP requirement for the provision of a tree protection plan for the Development, which will include provision for root protection areas and canopy spreads. The tree protection plan shall be formulated as required to eliminate the risk of construction damage to trees selected for retention. The tree protection plan would identify root protection areas and specify protective fencing as part of the arboriculture method statement to exclude these from the construction works.
- inform the mitigation and enhancement proposals contained within the Landscape and Ecological Mitigation Plans for the scheme of new tree planting which includes approx 150 new trees. This may include the need for tree surgery work, aeration of compacted soils, mulching and preparation of areas to be landscaped.
- inform the EMP development to ensure that the appropriate tree species are selected which can exist compatibly within the newly developed Site. In addition to the adequate provision of aerial and subterranean space sufficient to accommodate the tree at maturity. In relation to post construction after care including potential remedial work resulting from any construction related damage.

2.0 TREE CATEGORISATION

The BS5837:2005 'Trees in Relation to Construction- Recommendations' sets out the methodology for surveying trees on potential development sites in order to identify them within a prioritised system of retention categories, as summarised below:

A Category
Trees of high quality and value in such a condition as to be able to make a substantial contribution for a minimum of 40 years

B Category
Trees of moderate quality and value in such a condition as to make a significant contribution for a minimum of 20 years

C Category
Trees of low quality and value currently in adequate condition to remain until new planting could be established and expected to remain for a minimum of 10 years, or young trees with a stem diameter less than 150mm measured at 1.5 metres above ground level.

R Category
Trees in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboriculture or forestry management.
This standard provides subcategories 1-3 within the category system outlined above which indicate the area(s) in which a tree or group retention value lies.

1. Retention values that are mainly arboriculture.
2. Retention values that are mainly landscape.
3. Retention values that are mainly cultural, including conservation.

A tree may be considered to have a longer remaining life, but still be considered to be of a lower category given its maturity, condition or overall impact.

Categories A and B would be considered as a constraint and provide a substantial contribution to the site. A and B category trees should therefore be kept and incorporated where possible.

Generally C and R category trees are considered to be of low quality or are young specimens, which can be readily replaced and therefore should not be a constraint in terms of future development.

It is generally considered desirable to retain trees wherever reasonably possible to ensure continuity of tree cover and to provide a mature landscape.

This approach has been taken with the approach to the design evolution of the Development as set out in the Landscape and Ecological Mitigation Plans and draft EMP proposals.

2.1 Site Character Description

The Site lies within the northern fringe of Cambridge and covers a total area of 9.95ha in size and comprises three distinct areas which in descending area of the overall Site are as follows;

1. Chesterton Sidings, which it is proposed will contain the main station and interchange area of the Development. There are currently extensive freight lines within Chesterton Sidings which is managed by Network Rail as an operational rail facility. As such we understand that extensive site clearance is periodically undertaken.

2. Cowley Road, which will provide the public vehicular access into the Development. Cowley Road is adopted highway and is managed by the Highways Authority accordingly. As such we understand that routine safety maintenance management is undertaken to the verge.

3. Bramblefields LNR, which it is proposed will provide for local pedestrian and cycle access for the Development. The LNR is actively managed by Cambridge City Council as a Local Nature Reserve (see http://lnr.cambridge.gov.uk/reserves/bramblefields/)

2.2 Tree Protection Orders

It is understood that no trees contained within the proposed Site are protected by either a Tree Preservation Order (TPO) or are within a Conservation Area. The Bramblefields LNR is a site of local importance.

3.0 TREE SURVEY

Site visits were undertaken in 2012 and early 2013 and a representative sample of photographs taken within the Site can be found in Appendix A, illustrating the trees character within the three distinct areas of the Site. Chapter 9 of the ES constitutes the full assessment of the landscape character of the Site.
3.1 Summary of Results

The Site and its distinct 3 areas is illustrated in the maps contained within Appendix B. These maps illustrate the location of the various vegetation types within the Site, including:

- Broadleaved Plantation/Semi-Natural Woodland areas/groups;
- Scrub (Dense/Continuous and Scattered)
- Scattered Trees
- Hedgerow with Trees

Most of the woodland throughout the Site was classed as secondary plantation in nature. This included “all obviously planted woodland of any age” (JNCC, 2001). The majority of the woodland (plantation and semi-natural) areas encountered at Chesterton Sidings were considered to range in age from 5–20 years old. Additionally there are 5–30 year old trees along the boundary perimeters areas.

The composition and density of the tree resource varies over the three areas of the Site. The majority of the mature trees are either located at the northern end of Cowley Road (Adopted Highway) or around the perimeter of the Allotments and Bramblefields LNR.

Categorisation of the trees and tree groups within the Site will be undertaken as part of a separate detailed Arboriculture Survey as part of the EMP. It should be noted however that the vast majority of trees within the Site are generally young and category trees.

3.2 Chesterton Sidings

An area of semi-natural broadleaved woodland formed a thick belt along the south western boundary between Chesterton Sidings straddling and mainly on the allotments/Bramblefields LNR side of the Site boundary. Due to the composition of trees and its structure and density, this belt was not considered to be a hedgerow. The woodland community was dominated by trees comprising:

- Poplar sp.
- Field Maple
- Ash
- Oak, and
- Willow.

The Sidings are dominated by Dense/Continuous scrub, comprised mostly of Silver Birch, Bramble and Willow. Prior to recent clearance scattered trees and scrub were located within the Chesterton Sidings area near the main railway line, and along the boundary of the sidings. The scattered trees comprised a variety of species but were primarily comprised of Ash, Poplar and Sycamore trees. The scattered scrub were dominated by:

- Hawthorn
- Blackthorn
- Elderberry and
- Dog-rose.

3.3 Cowley Road

This zone contains the main area of plantation woodland, located along the boundary at the northern part of the Highway Access Route. Other plantation areas comprised linear planted strips along the site boundaries. The plantation communities were not very diverse in species of tree or shrub. Species include:

- Poplar sp.
- Field Maple.

1 Joint Nature Conservation Committee (JNCC), 2010, Handbook for Phase 1 habitat survey: a technique for environmental audit
2 BS 5837:2005 classifies all trees under 150mm as C Category.
- Ash,
- Guelder Rose
- Dogwood and
- Dog Rose.

Cowley Road contains the only significant Hedgerows located within the Site boundary. Some thicker belts of trees that superficially resembled hedgerows have been classified as plantation/semi-natural woodland. This approach was due to the composition and scale of the communities associated with them.

The hedgerows were considered to be species poor because of the low diversity of species associated with their composition. These hedgerows were dominated by Hawthorn and Dogwood with areas of Blackthorn. Standard trees within the hedgerow were predominately:

- Ash
- Poplar
- Field Maple and
- Oak.

All hedgerows were tall and gappy in places, consistent with neglected or only partial management.

The hedgerow along the northern boundary of the Highway Access Route was the only hedgerow associated with a ditch although it lacked a well developed vegetative under-storey owing to the density of the hedge and the subsequent shading it caused.

3.4 Bramblefields LNR

The majority of this area is covered with dense/continuous scrub, and the dominant plants were Hawthorn, Elderberry and Bramble.

Scattered trees and scrub were also evident. Like the Sidings the scattered trees comprised a variety of species but were primarily comprised of Ash, Poplar and Sycamore trees. The scattered scrub was dominated by Hawthorn, Blackthorn, Elderberry and Dog-rose.

3.5 Summary of the Site Tree Resource Investigations

Trees located within the main area of construction works are almost entirely limited to the areas of Scrub (Dense/Continuous and Scattered) associated with the Chesterton Sidings. Due to the periodic nature of site clearance in this area by Network Rail these are generally all C Category trees and therefore should not be considered a constraint upon the development.

The remainder of the trees, including those considered to be a higher retention category (e.g., those associated with the area of semi-natural broadleaved woodland along the south western boundary between Chesterton Sidings and the Allotments, scattered trees within Bramblefields LNR, hedgerows and semi-natural broadleaved woodland associated with the verges of Cowley Road), will be outside the main areas of construction works and should not therefore be significantly affected by the Development.

3.6 Tree & Landscape Mitigation Proposals

The site investigation identified trees that are likely to be affected by the construction works will be almost entirely limited to the areas of Scrub (Dense/Continuous and Scattered) associated with the Chesterton Sidings area of the construction works. Due to the periodic nature of clearance within the sidings by Network Rail these are generally all C Category trees and therefore should not be considered a constraint upon the Development.
The Ecological & Landscape Mitigation Plan proposals form the basis of the proposal for trees. These aspects will be addressed within the EMP, which includes provision for further tree and arboriculture surveys to inform detailed design in advance of the construction works. The applicant will seek the LPA approval of the EMP and the CEMP operational during the construction works.

4.0 ARBORICTURAL CONSIDERATIONS

This section considers the techniques which will likely form part of the findings from the development of the EMP as informed by detailed survey and design in accordance with the LPA requirements and based within the relevant statutes, policies and guidance for trees including, BS5837:2005 'Trees in Relation to Construction—Recommendations'.

4.1 Site Layout and Tree Related Conflicts

The design of the Development has utilised the majority of the higher quality mature trees onsite, an example is the retention of the majority of the mature trees identified within the area of semi-natural broadleaved woodland along the south western boundary between Chesterton Sidings and the Allotments, together with the hedgerows and semi-natural broadleaved woodland associated with the verges of Cowley Road.

It is proposed that to accommodate the development the majority of the young trees/low quality trees and groups of trees (largely C Category) located centrally to the Chesterton Sidings will be removed or considered for relocation (if they have good future potential).

Within the application open space 'corridors' have been included across the Site and on its boundaries permitting tree retention described above, but also provides the opportunity for tree relocation (of some of the younger better quality trees) and will provide potential for future tree planting.

The alignment of the individual elements of the proposal including buildings and access infrastructure have generally been orientated to the centre of the Sidings site, thereby reducing the conflict with the bulk of the larger, higher quality trees on the site boundaries and within Bramblefields LNR.

Unavoidable conflicts have arisen with regard to the Development and the lower quality trees identified within the tree survey, specifically the direct and indirect tree loss:

• to facilitate the construction of individual areas such as buildings etc.; and

• through the construction and/or upgrading of access infrastructure.

In addition there is potential for tree related conflict during the construction phase i.e. unnecessary damage to retained trees and their soils, therefore use of tree protection has been identified.

4.2 Below Ground Constraints

The below ground constraints are generally confined to the Root Protection Area (RPA). The RPA is a circular area with a radius 12 or 10 times the diameter of the trees measured at 1.5m or at ground, level respectively. The RPA is the minimum area in which no ground works should be undertaken without due care in relation to the retained tree(s) in order to avoid soil compaction, root severance, changes in levels or soil contamination which could reduce future tree health and/or stability. The shape of the RPA and its exact location will depend upon arboriculture considerations and ground conditions.

Following detailed Arboriculture Surveys, the RPA for the trees will be calculated as prescribed by BS 5837:2005 and shown as circles for simplicity on an Arboriculture Implications Plan as part of the CEMP. These plans will illustrate the relationship between the RPA’s associated with the trees and the proposed development.
In addition a Tree Schedule will display the root protection calculations for each tree or group of trees where Radius (m) is the distance of root protection from the main stem and Area (m²) is the overall root protection area.

The potential amount of high quality tree loss and associated RPA incursions to facilitate the proposed development has been minimised by sympathetic design, however, there is likely to be RPA incursion of trees and potential conflict in the specific areas outlined above.

Tree retention is preferred although it is noted that misplaced retention of trees may be counterproductive where insufficient above and below ground space allowance, nutrients and water availability may cause long term tree decline or death.

4.3 'No Dig' Construction Information

Here there are RPA incursions of valuable trees by development it is sometimes appropriate to consider 'no dig' construction techniques for access roads, footpaths, parking spaces or structures. As the detailed designs evolve 'no dig' construction opportunities should be taken into account where possible.

The benefit of the 'no dig' system for access roads, footpaths and parking spaces is that no tree roots are cut, it spreads the load of the construction thereby reducing the compaction of the soil and finally when a permeable surface layer is applied there still remains a water and gaseous exchange essential for healthy tree roots. This method limits the potential stresses to trees compared with conventional construction methods; it is widely used for footpaths, driveways and access roads close to trees. A well-used brand name is 'CeilWeb' although similar products are available.

Where RPA incursions are under building footprints trench fill foundations are not recommended due to potential root severance. Where high value trees are to be retained alternative options to trench fill foundations include pile and beam foundations, cantilever foundations or innovative designs such as 'Housedock'. It should be noted that this situation is not currently anticipated anywhere on the proposed scheme.

4.4 Potential for Tree Spading

There is the possibility to relocate existing trees and appropriately replace trees in locations complementary to the positioning of the Development.

With regard to the relocation of trees utilising a tree spade it is noted that the majority of the young trees within the Site are at an ideal size for this approach. Trees of good form and complementary to the planting mix of species should be considered.

4.5 Tree Protection Plan

During the construction phase of the development the key method of protecting the retained trees is through protective tree barriers/fencing enforcing the Construction Exclusion Zone (CEZ). The following aspects will be incorporated into the EMP and CEMP.

The principal protection for the retained trees (above and below ground) and associated soils within the site is through the maintenance of the CEZ. The CEZ will be important throughout construction works and no access will be allowed to the area other than operations specified below.

The positioning of the CEZ should be on the edge of the RPA. The shape of the RPA and their exact location will depend upon arboriculture considerations and ground conditions. In the majority of cases they are adjusted to include tree crowns to prevent damage by construction machinery.
Prior to any onsite construction tree protective measures and the CEZ must be in place. These will be checked prior to the commencement of works. The installation of tree protection will be undertaken before work commences.

4.6 Ensuring the Integrity of the Construction Exclusion Zone

To guarantee the protection that the CEZ provides to retained trees and soils the following must be carefully adhered to when planning construction works:

- The protective tree fencing shall be maintained throughout the development phase.
- No materials, machinery, temporary structures, chemicals or fuel shall be stored within the CEZ.
- No excavations or increases in soil level within the CEZ are permitted without prior written approval from the LPA.
- Care should be taken to ensure that wide or tall loads or plant with booms, jibs and counterweights do not come into contact with retained trees. Any transit or traverse of plant in close proximity to trees should be conducted under the supervision of a banksman to ensure that adequate clearance from trees is maintained at all times.
- Material which will contaminate the soil such as concrete mixing, diesel oil and vehicle washing must not be discharged within 10m of the tree stems. Fires must not be lit in a position where their flames can extend to within 5m of foliage, branches or trunk. This will depend on the size of the fire and the wind direction.
- Any landscaping within the CEZ must avoid soil disturbance. Therefore regrading and rotavators are not permitted. Any agreed soil re-profiling to facilitate final agreed levels must be carried out by hand with topsoil.

4.7 Fencing Specification

Where it is deemed necessary to erect tree protective fencing, e.g. to protect identified specimen trees and groups, it will conform to the following construction unless an alternative structure is otherwise agreed appropriate under the CEMP.

The barriers will be made from scaffold in a vertical and horizontal framework, in accordance with 855837:2005 with vertical tubes up to 3 metres apart. The framework will be braced to resist impacts.

5.0 OTHER CONSIDERATIONS

Hard standing areas such as concrete and tarmac within RPAs can generally be removed during the demolition and construction phases of development, so long as investigation into root activity under the surface is appropriately undertaken in advance of any ground works to avoid unnecessary root severance.

With regards to further below ground infrastructure, there is insufficient information available at present to comment as to whether or not there would be adequate space for these to be installed outside of RPAs. If services do enter RPAs the use of hand digging as detailed in the National Joint Utilities Group publication 'Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees' (NJUG 10, Volume 4, 2007) will be undertaken to minimise the impact on the tree roots.

6.0 CONCLUSIONS

This report has been commissioned to support a planning application for the Cambridge Science Park Station and Interchange.

It is considered desirable wherever possible that trees and groups of trees will be retained although care will be exercised over misplaced tree preservation. In terms of the proposed Ecological and
Landscape Mitigation Plans, careful design has accommodated many of the higher quality trees reducing tree related conflict and unnecessary tree removal.

A significant proportion of young trees on the Chesterton Sidings area of the Site will be removed. These trees are considered to be of low quality or are young specimens which can be readily replaced and therefore should not be a significant constraint in terms of future development.

It is crucial that the final design considers potential impacts on higher quality trees in detail and that there is adequate mitigation for tree loss in the Ecological and Landscaping Mitigation Plan and EMP as approved by the LPA.

The trees to be retained should be adequately protected throughout the construction works and they should be proactively managed through the proposed CEMP to ensure that they enhance the development and the wider environment.

While there maybe a perception of short-term loss of amenity with regard to the proposals in the Ecological & Landscape Mitigation Plan, this strategy provides substantial new tree planting in locations that will complement the retained tree resource and ensure greater longevity.

Approximately 150 new trees with suitable species choice have been incorporated into the Ecological and Landscape Mitigation Plan proposals to augment and improve the arboriculture, ecological and aesthetic value of the Development. This will be developed through the provisions of the proposed EMP and careful detailed design.

This new tree planting will mitigate for the loss of trees on the Site and will enhance the long-term amenity and continuity of tree resource within the Site and wider area.
7.0 RELEVANT POLICIES AND GUIDANCE

National Planning Policy Framework 2012
Cambridge City Local Plan (2006) policy 4/4 Trees
South Cambridgeshire Development Control Policies PO (2007) policy DP/2 Development Guidance
British Standard 5837:2005 'Trees in Relation to Construction Recommendations

South Cambridgeshire Trees and Development Sites SPD (January 2009)


The Forestry Act 1967.


Figure 1-Map of the whole area of Chesterton Sidings and the adjacent Bramblefields LNR
Figure 2 - Map of the Chesterton sidings earmarked for the new Cambridge Railway Station and Interchange
Figure 3 - Map showing the Highway and Busway Access Routes

Legend
- Broad leaved plantation woodland
- Tall ruderal
- Ephemeral/short perennial
- Building
- Hardsurface
- Running water
- Species poor
- Hedge and trees
- Scrub scattered
- Target note
Figure 4: Map showing the Bramblefields LNR and allotments along the south western boundary of the Site.

Legend:
- **:** Arable (Allotments)
- **:** Buildings
- **:** Hard surface
- **:** Individual trees
- **X:** Scrub scattered
- **O:** Target node

- **D:** Standing water (Pond)
- **:** Semi-improved neutral grassland
- **:** Broad leaved semi-natural woodland