Tree survey

Sipson Village

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1. Executive Summary

1. This report has been prepared by Jonathan Hazell for David Newman, Partner, Quartet Design, The Exchange, Lillingstone Dayrell, Bucks, MK18 5AP.

2. The site was visited on Thursday 4 July 2013, the data has been post-processed and is attached.

3. Pedestrian access to a significant proportion of the site was impossible:

    1. much of the site was overgrown with head-high ruderal vegetation, and

    2. the continuing presence of the garden centre's secure boundary fence limited access to the northern boundary, and

    3. access to a significant proportion of the south of the site was denied by the presence of informal, but none-the-less secure, barricades and fences

4. The 38 individual trees that were surveyed were placed into categories by reference to *Table 1 Cascade chart for tree quality assessment* from BS 5837:

    1. Category A: *Trees of high quality with an estimated remaining life expectancy of at least 40 years,*

        - *no trees*

    2. Category B: *Trees of moderate quality with an estimated remaining life expectancy of at least 20 years,*

        - *two of the Lawson cypress near the garden centre entrance T2, T3 and horse chestnut T36 at the bottom of the site*

    3. 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, and*

        - *27 trees, generally those that had been planted surrounding the now-abandoned garden centre*

    4. Category U: *Those in such a condition that they cannot be realistically retained as living trees in the context of the current land use for longer than 10 years*

        - *8 trees, mostly species such as hawthorn (Cratageus monogyna), goat willow (Salix caprea) and sycamore (Acer pseudoplatanus).*

Jonathan Hazell
Independent arboricultural consultancy
8 July 2013

2. Introduction

1. This report has been prepared by me, Jonathan Hazell BSc (Hons) FArborA, for you, David Newman, Partner, Quartet Design, The Exchange, Lillingstone Dayrell, Bucks, MK18 5AP.

2. In this report the following terms have particular meanings:

    1. *hazard* is used as defined by the HSE in *HSG65 Successful health and safety management* to express the potential to cause harm, be that injury to persons or damage to property (see *target* below), and

    2. *risk* is used as defined by the HSE to express the likelihood that an undesired event will occur due to the realisation of a hazard, and

    3. *target* is used as defined in *BS 3998: 2010 Tree work – Recommendations*
    "a person or object, whether mobile or fixed, within the potential zone of impact of a tree or its branches, which might be harmed as a result of the partial or total failure of the tree
    NOTE The term can also refer to a pedestrian or vehicular route where harm might thus occur."

1. The information supplied to me

1. You have provided me with the following as PDF (referred to hereafter individually and collectively as the site drawings):

    1. an extract from the *Design and Access Statement* prepared by Robert Partington Architects, and

    2. an extract from *Google ™ earth* indicating the location of the site.

2. My brief

1. According to my proposal reference *C / 011.1*, dated 25 June 2013, the agreed brief was:

    1. *To undertake a tree survey and report against the requirements of Design Stages A – D as referred to in* Figure 1: The design and construction process and tree care *of* BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations *(referred to hereafter as BS 5837) at the site shown on the extracts from the* Sipson Village Design And Access Statement *and Google ™* earth *as supplied by email on 25 June 2013*

        1. *Design Stage A*

            1 *to undertake the tree survey using a hand-help GPS device, and*

            2 *to locate the features of interest on an electronic map, and*

            3 *for the trees that may influence any proposed development to report the range of qualitative and quantitative attributes as recommended by BS 5837, and*

            4 *to categorise those trees by reference to* Table 1 Cascade chart for tree quality assessment *see the extract from BS 5837 below, and*

            5 *to include the broad detail with the attribute data from* Appendix A *National House Building Council,* Part 4 Foundations Chapter 4.2 Building near trees, *NHBC, 2010.*

        2. *Design Stage B*

            1 *to identify the various tree constraints and to record those trees' root protection areas as determined by reference to* Annex D *of BS 5837.*

3. *Design Stage C*

    1 *to identify potential trees for retention or removal.*

4. *Design Stage D*

    1 *to provide the information to allow for the production of a tree protection plan, see the extract from BS 5837 below 5.5 Tree protection plan.*

    2 *To provide comprehensive professional reports based upon my findings.*

    3 *To supply the final outputs in electronic format only, the tree survey plan as either a DWG or SHP file, the attribute data and the narrative as PDF.*

    4 *This proposal does not make any allowance for or include any time charges for discussions with the local planning authority's officers; if required they will be considered to be a variation (see below).*

3. My instruction

1. You instructed me to proceed in a telephone call on Thursday 27 June 2013.

3. The fieldwork for this report

1. I visited the site on Thursday 4 July 2013 to undertake the survey, the attribute data is attached as *Annex 1*, and the tree survey plan and tree protection plan are attached as *Annex 2*.

2. I placed the trees that were surveyed into categories by reference to *Table 1 Cascade chart for tree quality assessment* (referred to hereafter as *Table 1*) from BS 5837:

    1. *Category A: Trees of high quality with an estimated remaining life expectancy of at least 40 years,*

    2. *Category B: Trees of moderate quality with an estimated remaining life expectancy of at least 20 years,*

    3. *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, and*

    4. *Category U: Those in such a condition that they cannot be realistically retained as living trees in the context of the current land use for longer than 10 years*

3. A number of photographs were taken with a Nikon® *Coolpix S3100* digital camera: exposure settings and shutter speeds were set to automatic to optimise picture quality given the light conditions: subsequently, the images were re-sized using FastStone® *Image Viewer for Windows*, version 4.7 and some panoramas have been created from multiple re-sized images using ArcSoft® *Panorama Maker 6 Pro™*, the picture quality may have become slightly distorted during the process.

4. The findings from the fieldwork

1. In summary

1. A significant proportion of the site was overgrown with head-high ruderal vegetation which prevented pedestrian access.

Image 1: the head-high ruderal vegetation that covered much of the site

2. Access to the whole of the northern boundary was constrained by the continuing presence of the garden centre's secure boundary fence adjacent to where the poly-tunnels of the now-abandoned garden centre had once stood.

Image 2: the northern boundary showing the garden centre's secure boundary fence (panorama)

3. Access to the rear of the properties along Sipson Road and Russell Gardens was impossible due to the overgrown nature of the site.

Image 3: the mass of vegetation behind Sipson Road

4. Access to a significant proportion of the south of the site was denied by the presence of informal, but none-the-less secure, barricades and fences. These barriers, which may have been in position for some years, were often disguised by the burgeoning vegetation but may be just glimpsed in several of the site photos.

Image 4: one small section of barrier is just visible in the centre of the image

5. The attribute data for the 38 individual trees that were surveyed is attached as *Annex 1*. The dataset includes the trees' *Root Protection Area* (referred to hereafter as RPA) as quoted in *Annex D* of BS 5837, which rounds

up the measured of calculated stem diameter to the nearest 25 mm. In addition, basic data related to the species has been extracted from the NHBC [1].

6. None of the individual trees that were surveyed were considered to be of particular merit; the 38 records that were captured were split between the four categories from *Table 1* as follows:

    1. *Category A*: no trees,

    2. *Category B*: three trees, two of the Lawson cypress near the garden centre entrance, T2 and T3, and the horse chestnut T36 at the bottom of the site,

    3. *Category C*: 27 trees, mostly planted trees surrounding the now-abandoned garden centre, and

    4. *Category U*: 8 trees, mostly self-set pioneer weed species such as hawthorn (*Cratageus monogyna*), goat willow (*Salix caprea*) and sycamore (*Acer pseudoplatanus*).

2. In detail

1. I gained access to the site through a gate in the south east corner where a substantial multi-stemmed sycamore (*Acer pseudoplatanus*) had been poorly crown lifted to allow high sided vehicles to access the site through the gate.

Image 5: the sycamore in the south east corner of the site, branch removal is evident presumably to allow access to the site for high sided vehicles

2. I then moved north along a well-defined but informal vehicle track, passing a patch of elm sucker regeneration (*Ulmus* sp.) near to the overhead gantries over the M4 spur into Heathrow airport, but was unable to access the north eastern boundary because of the wild and overgrown nature of the site. Where individual trees existed they were of pioneer species, such as hawthorn (*Cratageus monogyna*) or goat willow (*Salix caprea*), and were small (both low growing and with compact canopies) and apparently therefore relatively recently established. I did not see any individual trees or groups of trees of merit, as assessed under *Table 1*, in this part of the site.

1 NHBC, 2010. *NHBC standards: Chapter 4.2 Building near trees*. National House Building Council, Milton Keynes, UK

Image 6: the elm regeneration on the eastern flank of the site (panorama)

Image 7: the ruderal vegetation to the north of the site

3. I was able to access the individual trees surrounding the abandoned garden centre buildings in the north west corner of the site and to use the GPS device to record the locations of individual trees in this area. These planted, as opposed to self-set, trees fell into two categories:

    1. individual exotic ornamental conifer cultivars of Lawson cypress (*Chamaecyparis lawsoniana*), which had presumably been planted to advertise the garden centre business, and

    2. a broadleaved hedge primarily composed of purple leaved plum (*Prunus cerasifera* Nigra) with the occasional mountain ash (*Sorbus aucuparia*).

Image 8: looking north west along the hedge along the northern boundary, T5 to the left of centre

4. A fence to the north of the car parking area prevented access to an apple (*Malus domestica*) and a flowering cherry (*Prunus avium* in variety).

Image 9: beyond the car park fence (panorama)

5. Where the site boundary stepped to the north behind the abandoned buildings (where the goat willow (*Salix caprea*) T26 was located) I was denied access once again to the edge of the site by the rampant vegetation. Whilst flowering cherry was again evident I did not see any individual trees or groups of trees of merit, as assessed under *Table 1*, in this part of the site. The poplar evident in the panorama below were on the Holiday Inn site, the pine may have been within the site boundary but were inaccessible.

Image 10: the northern boundary, looking out of the garden centre (panorama)

6. On the eastern limit of the concrete pad behind the abandoned buildings a few goat willow (*Salix caprea*) had struggled to establish themselves: all were multi-stemmed, some had been damaged by grazing horses, but none was considered worthy of retention as assessed under *Table 1*.

Image 11: the goat willow flanking the concrete pad

7. The boundary to the west of the site, south of the garden centre and bordering the rear gardens of Sipson Road and Russell Gardens, was out of reach but a relatively tall ash (*Fraxinus excelsior*) was plotted by eye rather than by using the GPS. As it was not possible to access the tree it was not possible to assess its diameter or its condition, and so the categorisation of the tree under *Table 1* has not been carried out.

Image 12: the ash behind Sipson Road

8. Working south along the western boundary proved to be impossible, not simply because of the vegetation but because some of the site seemed to have been occupied and secured: members of an informal community *Transition Heathrow* living outside the south west corner of the site suggested in conversation that they may have been responsible. The aerial photography from both Google ™ earth and bing ™ maps suggests that there may have been a number of unregulated structures and barrier fences on the site for some time.

Image 13: the entrance to Transition Heathrow in Vineries Close

Image 14: the Google ™ earth image of the south of the site, retrieved 8 July 2013, showing what appears to be structures within the wooded area at the south of the site: the image date is given as 27 June 2010

9. To the north west of this occupied area was a line of conifers which I presume had been deliberately planted, however they now exhibit dead tops as symptoms of an unknown stress: as access was not possible their attributes have not been included in the schedule. A single emergent sycamore, which in all probability was self-set, was located in the centre of the informal site boundary. These trees were not plotted as their position could not be determined with any degree of confidence. Even though access was not possible the poor condition of the conifers (evident from a distance rather than close inspection which was not possible because of access difficulties) and the relative youth (and pioneer nature) of the sycamore meant that these trees were not considered worthy of categorisation as anything more than C under *Table 1*.

Image 15: the conifers, their dead tops clearly evident even in this poor image

Image 16: the sycamore to the east of the conifers shown in image 15

10. There were three substantial, mature, broadleaves along the southern boundary: unfortunately two of the three were a significant hazard, in relatively poor condition with major defects (the sycamore (*Acer pseudoplatanus*) had a substantial cavity in the southern most limb above the fork, callusing well but not doubt an entry point for decay organisms, and the lime had a significant wound at ground level that was attempting to occlude). Whilst the site is unoccupied their condition is not a cause for concern or comment, however should the site be developed then the risk that the trees will represent to targets will need to be addressed.

Image 17: T35 the sycamore to the south of the site, image taken looking north

Image 18: the base of T37 the lime, image taken looking south, with automatic flash

5. Tree protection

1. Trees deserving of protection

1. In general trees on the development site will require protection from all the activities associated with the development proposal if they have sufficient arboricultural, historical or cultural value, or amenity benefit to be thought of as a "material consideration" in the planning process.

2. The RPA for all the surveyed trees has been calculated, and is shown on the tree protection plan.

3. During the survey of this site I was only able to locate three trees that, in my opinion, met the above criteria, T2 and T3 near the garden centre entrance and T36 at the bottom of the site.

4. However, that is not to say that the remainder of the tree population on the site is not deserving of protection in the short term, at least until such time as those trees begin to detract from any amenity benefit as introduced by the landscape scheme that will be implemented as a condition upon the proposed development.

2. The protection of tree roots

1. Tree roots serve two distinct purposes, to securely anchor the tree in the ground and to take up the moisture and the range of nutrients from the soil (generally dissolved or in suspension) that will allow the tree to grow.

2. Tree roots are living and to survive and function properly must have access to the oxygen and water held in the voids between the soil particles, therefore they are found at relatively shallow depths where such exchanges can take place. Patch and Holding [2] provides a very useful summary of tree root growth and state:

2 Patch, P and Holding, B. 2007. *Arboricultural Practice Note 12: Trees in focus: Through the trees to development* Arboricultural Advisory and Information Service, Farnham, UK

"Survival of a tree depends upon its roots being able to absorb enough water from the soil to sustain the foliage . . . and on developing a strong root system capable of keeping the tree upright . . . . In reality tree roots:

- *grow in any direction more or less parallel with the soil surface*
- *are usually relatively shallow – most of a tree's roots are in the upper metre of soil*
- *usually radiate outwards from a tree for a distance equivalent to at least the tree's height*
- *can be 30 cm or more in diameter at the base of the trunk*
- *sub-divide and taper rapidly as they extend out from the trunk*
- *are only 2 – 3 cm in diameter, and often much less at 3 – 4 m distance from the trunk*

. . .

Most trees that have been growing undisturbed on a site for many years will have developed an extensive root system with the roots growing where the soil conditions are most favourable. There will be a balance between the development of the crown (which demands water) and the roots (which supply it). Any sudden alteration of the soil conditions within the tree's rooting area (a circle of radius equal to the tree's height) will therefore upset this balance."

(Patch, P and Holding, B, 2007: 1,2)

3. Similarly, the National Joint Utilities Group [3] (hereafter referred to as *NJUG*) provide a very useful description of the pattern of root growth, written particularly for their target audience within the utility sector:

"The base of a trunk typically flares out in buttresses extending into the main lateral structural roots. These rapidly subdivide into the mass of smaller roots which serve to anchor the tree into the soil and transport water and nutrients. Even at a short distance (3 m) from a large mature tree, most roots will be less than 10 mm in diameter, but these may extend to well beyond the branch spread of the tree. A mass of fine roots, less than 1 mm in diameter, develop off all parts of this root system. These fine roots also absorb the water and nutrients, which are essential for the growth of the tree.

The main structural roots (close to the trunk) develop as the tree grows in response to the need for physical stability. Beyond these major roots growth is influenced by the availability of water, air and nutrients in the soil. Disturbance of soil provides ideal conditions for root growth. Apparatus is often cooler than the surrounding soil encouraging moisture within the soil to condense on its surface stimulating root growth close to the apparatus. For all these reasons root growth is often most prolific within the backfilled trench and in the soil around the apparatus."

(NJUG, 2007: 7, 8)

3. Damage to tree roots

1. In the rooting area a tree's roots may be at risk from development activity, particularly the excavation of the ground close to the trees to be retained; this action may lead to direct or indirect damage to those trees' roots.

1. Direct damage

1. Roots of retained trees may be at risk from the development proposal because excavations in the rooting area may lead to the complete severance of a root, or root damage caused by a tool or machine being used to dig an excavation, or to scrape the existing surface, or to install drains or services.

2. Direct damage to roots will reduce the security of the tree's anchorage and may lead to the risk of failure and so an increased risk of damage to targets. Moreover, such damage will alter the balance

3 NJUG, 2007. *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees* National Joint Utilities Group Ltd, London, UK

between the capacity of the tree's root system to absorb oxygen and water and the demands of the leaves.

2. Indirect damage

1. Indirect damage in the tree's rooting area may result from the narrowing or closure of the voids between the soil particles because of compaction caused by the passage of a machine over unprotected ground: the compaction will reduce the volume of, or number of voids, and so the amount of oxygen and water available to the roots preventing them from growing optimally. Continued traffic will increase the compaction and cause further difficulties for the roots and in turn the canopy.

2. Indirect damage in the tree's rooting area may also be a result of impeding air movements to the trees' roots by placing an impervious or impermeable cover over the soil, including use of the area containing root growth for spreading spoil. This cap will reduce the availability of oxygen or moisture to the roots leading to progressive crown dieback until a new balance has been reached between the capacity of the tree's damaged root system to absorb oxygen and water and the demands of the leaves.

2. In the event that roots are directly damaged and exposed during excavation within the rooting area it will not be possible to ascertain from which tree they came (i.e. a tree to be retained or not) and so it will be important to observe the following principles, as taken from NJUG:

> *"Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled."*
>
> *(NJUG, 2007: 19)*
>
> *"Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.*
>
> *All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound."*
>
> *(NJUG, 2007: 21)*

3. Whilst I am not an engineer and so not competent to discuss back filling I would make the case that during any back filling works:

1. any dry sacking or hessian wrapping around tree roots be removed before the trench is filled, and

2. retained roots be packed around with sharp sand (the high salt content of builders' sand is toxic to tree roots), or other inert loose granular fill, before the soil or other material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

4. The erection of a robust construction exclusion zone according to the specification in BS5837 should be sufficient to prevent intolerable indirect damage to tree's roots, see *Figure 2 Default specification for protective barrier* (reproduced here in *Appendix 1*), but there is no obligation to create such a rigid and robust barrier.

4. Damage to the trees' canopies or stems

1. If direct damage to the crown of a tree to be retained should occur it will alter the balance between the demands of the leaves and the tree's root system's capacity to absorb oxygen and water. This may result in progressive crown dieback, because the availability of soil oxygen and water has been reduced affecting the tree's ability to sustain its foliage, until equilibrium can be achieved between the capacity and capability of the remaining functional root mass and the demands of the tree's crown.

2. Post-development it may be prudent to consider engaging an arboricultural contractor to attend to any damage that may have occurred during the works.

5. The tree protection plan

1. The accompanying tree protection plan, attached as *Annex 2*, indicates the extent of the root protection areas for the trees that have been surveyed.

6. Report constraints and legislative issues

1. Intellectual property

1. Unless otherwise agreed in writing all intellectual property rights arising out of the provision of this report shall vest in me. Subject to my having been paid all sums due under the Agreement I shall grant to you a worldwide non-exclusive non-transferable royalty free licence to use and have used the intellectual property for any purpose.

2. Report constraints

1. The hazard tree assessments that were carried out and reported are a snapshot of tree health and condition at the time of the assessment and represent my observations made following an external assessment of symptoms from ground level, no tools or machines will have been used during the assessment.

2. Trees are living organisms and their condition may have changed after I left site for a variety of reasons, including but not limited to:

    1. as a natural consequence of their pattern of growth, and/or
    2. in response to the changes in neighbouring plants, from whatever cause, and/or
    3. in response to the weather, either an extreme weather event or a prolonged spell of consistent weather, and/or
    4. as a consequence of infection or infestation, and/or
    5. as a consequence of a pollution incident, and/or
    6. in response to changes in soil condition or structure.

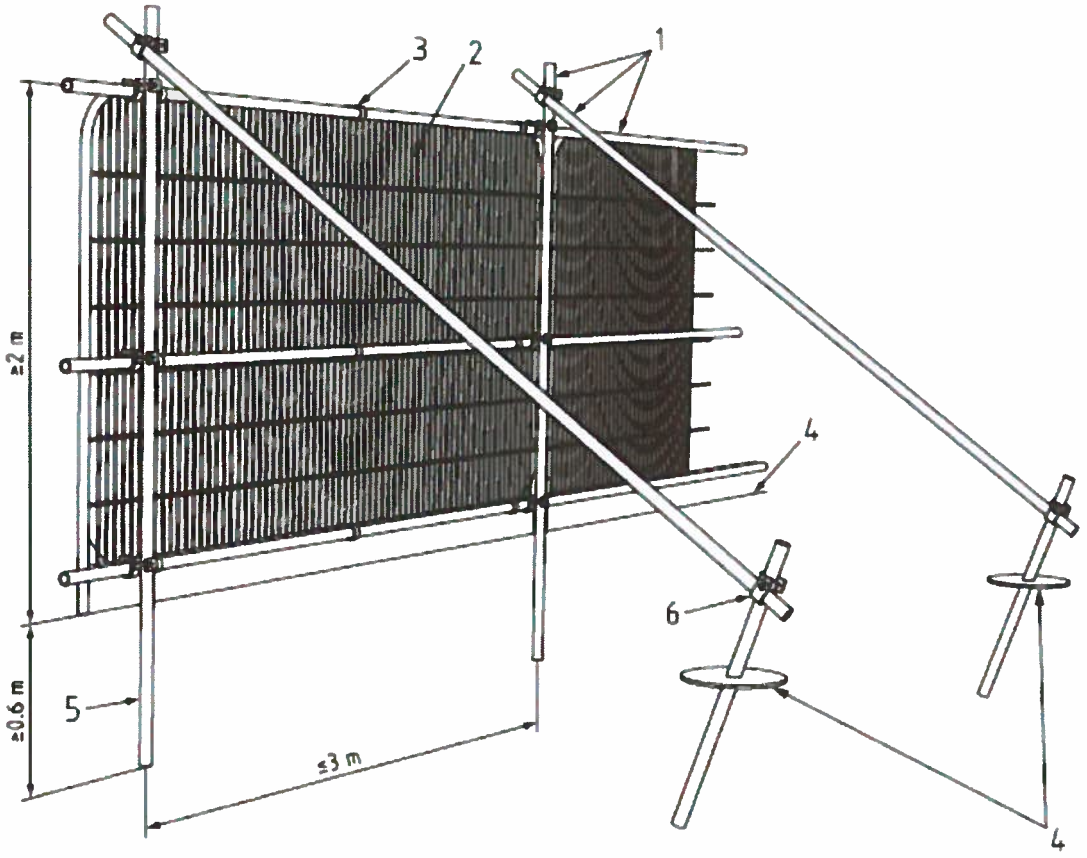
3. Planning legislation

1. For the purposes of this project I have made no enquiries with any of the local planning authorities concerning the application of any planning covenants of whatever kind (be they or local, regional, national or European interest) or authority (be that a local interest group, local byelaw, UK statute or national or European Regulation) that may affect any of the sites.

4. Environmental legislation

1. For the purposes of this report I have made no enquiries with any authority concerning the application of any environmental covenants of whatever kind or authority that may affect any of the sites.

Appendix 1 – BS 5837: Figure 2 Default specification for protective barrier



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Annex 1 – The attribute data

Annex 2 – The tree survey plan and the tree protection plan