ETHICAL ARBORICULTURE

Arboricultural Report inline with BS5837:2012

83 New Road Sutton Bridge

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1 Introduction

This report was commissioned by Mark Bonner of FenDraw design and planning to survey trees in connection with a planning proposal for a fence installation at 83 New Road Sutton Bridge in accordance with BS5837: 2012; Trees in Relation to Construction.

Trees can offer many benefits, including:

- Providing visual amenity, softening or complementing the effect of the built environment, and adding maturity to new developments
- Displaying seasonal change and providing opportunities for wildlife in built up areas;
- Making places more comfortable in tangible ways by contributing screening and shade, reducing wind speed and turbulence, intercepting snow and rainfall, as well as reducing glare.

Trees are also important elements of green infrastructure, contributing to urban cooling through evapo-transpiration and providing micro-climatic effects that can reduce energy demands in buildings. They therefore represent a key resource that can significantly contribute to climate change adaption.

Existing trees are an important factor on construction sites, whether on or near the working areas, and trees are a material consideration in the UK planning system. Root systems, stems and canopies, with allowance for future movement and growth, need to be taken into account in all projects, including those that do not require planning permission. The space required for any proposed new trees to become established is an important consideration.

During their lifetime, trees will be vulnerable to disturbance, injury, environmental changes, pests and diseases. Construction work often exerts pressures on existing trees, as do changes in their immediate environment following the construction. A tree that has taken many decades to reach maturity can be damaged irreparably in a few minutes by actions that might be unwitting, negligent or wilful. The early provision of physical protection from damage is therefore critical.

Where tree retention or planting is proposed in conjunction with nearby construction, the objective should be to achieve a harmonious relationship between trees and structures that can be sustained in the long term.

As there are trees over 75mm diameter at 1500mm above ground level on this site, which could contribute to the character and appearance of the site, it is necessary to ascertain the quality and value of the trees and the likely impact that the proposed development could have on them. In addition it is necessary to consider the impact retained trees could have on the development in the future.

Trees differ in their tolerance of root loss or disturbance, according to their age, species, and condition. In addition root growth, while typically situated in the top metre of soil, can be affected by existing site features, including natural and man-made topography and structures that can restrict tree root growth in any direction. Consideration is given to all relevant factors when ascertaining the viability of root retention.

2 Terms and Definitions

For the purposes of this report, the following terms and definitions apply.

2.1 access facilitation pruning

One-off tree pruning operation, the nature and effects of which are without significant adverse impact on tree physiology or amenity value, which is directly necessary to provide access for operations on site.

2.2 arboricultural method statement

Methodology for the implementation of any aspect of development that is within the root protection area (**2.7**), or has the potential to result in loss of or damage to a tree to be retained.

2.3 arboriculturist

Person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction.

2.4 competent person

Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached.

2.5 construction

Site-based operations with the potential to affect existing trees.

2.6 construction exclusion zone

Area based on the root protection area (**2.7**) from which access is prohibited for the duration of the project.

2.7 root protection area (RPA)

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 is treated as a priority.

2.8 service

Any above or below-ground structure or apparatus required for utility provision.

NOTE examples include drainage, gas supplies, ground source heat pumps, CCTV and satellite communications.

2.9 stem

Principal above-ground structural component(s) of a tree that supports its branches.

2.10 structure

Manufactured object, such as a building, carriageway, path, wall, service run, and built or excavated earthwork.

2.11 tree protection plan

Scale drawing, informed by descriptive text where necessary, based upon the finalized proposals, showing trees for retention and illustrating the tree and landscape protection measures.

2.12 veteran tree

tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

NOTE these characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem. (BS3998:2010)

3 Report Limitations

All the trees have been inspected from ground level with the aid of binoculars using visual observation methods and a sounding mallet where required. Should a more detailed report be required then this will be outlined within the recommendations.

Tree and canopy heights have been defined with the use of a laser range finder and clinometers, with diameter being obtained via the use of girth tape. Crown diameters are measured using both a laser range finder and tape measure where practical.

Trees are living organisms whose health and condition can change rapidly. The health, condition and safety of the trees therefore should be checked on a regular basis, preferably once a year. The conclusions and recommendations in this report are only valid for a period of one year. The period of validity maybe reduced in the case of any change in site conditions or to arboricultural works being carried out on the tree or trees in question.

4 General Information

The enclosed report gives you information on the tree's at the property, which were assessed as needing to be covered and shows the type of tree, its height and the trunk diameter , so that a root protection area, RPA, can be worked out and plotted on the tree constraints plan, TCP.

4.1 Root Protection Areas/Construction Exclusion Zones

The root protection area is a layout design tool to indicate the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree and is calculated using a theoretical circle.

The RPA is calculated as an area equivalent to a circle with a radius 12 times the diameter of the trunk measured 1.50 metres above the ground. For trees with more than one stem, one of the two calculation methods below should be used

A : square root of (stem diameter1)2 + (stem diameter)2 + ...(stem diameter)2

B:square root of (meanstem diameter)2 x number of stems

This is illustrated on the tree survey schedule with the use of an S for single stemmed trees or a M for multi stemmed trees. However in many cases it is not expedient or practical to use a circular RPA and as such BS5837 recognises this and allows the shape of the RPA to be changed but not reduced in area, see British Standards 5837:2012 Tree's in relation to construction – recommendations, page 8, table 2, which shows the RPA in square metres.

The RPA of each tree in category A, B, and C is capped at 707 square metres which is equivalent to a circle with a radius of fifteen metres, however the shape may be changed depending on the following factors whilst still providing adequate protection for the root system:

a) The morphology and disposition of the roots when influenced by past or existing site conditions (e.g. the presence of roads, structures and existing underground apparatus);
b) Topography and drainage;
c) The soil type and structure;
d) The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.

This area or areas are also known as the Constructor Exclusion Zone and need to be fenced off with as per figure two- Protective barrier, as shown on Page 13 of British Standards BS5837:2012, to ensure the long term retention of a tree.

4.2 Tree Survey

The tree survey should include all trees included in the topographical survey as well as any that might have been missed (e.g. on shrinkable soils, additional off site trees that could have an effect on foundation design). The trees should be sequentially numbered and, where appropriate, tagged, with the tags being placed as high as is convenient on the stem of each tree.

Individual trees, groups or woodland should be indentified and assessed as such where the arboriculturist determines that this is appropriate. However an assessment of individuals within any group should still be undertaken if there is a need to differentiate between them, e.g. in order to highlight significant variation in attributes (including physiological or structural condition).

The categorization of a group or woodland can reflect a future potential that is contingent on appropriate management being undertaken to promote the development of the better specimens, based upon established arboricultural and silvicultural principles. Such management requirements should be noted under "general observations" within the schedule and included in the post-development management plan.

A schedule to the survey should list all the trees or groups of trees. The following information should be recorded.

a) Sequential referencing number (to be recorded on the tree survey plan).
b) Species listed by common name, with a key provided to scientific names.
c) Height
d) Stem diameter
e) Branch spread, taken as a minimum at the four cardinal points, to derive an accurate representation of the crown (to be plotted on the tree survey plan)
f) Existing height above ground level of
    1. First significant branch and direction of growth
    2. Canopy
g) Life stage (e.g. young, semi-mature, early mature, mature, over mature)
h) General observations, particularly of structural and/or physiological condition(e.g. the presence of any decay and physical defect), and/or preliminary management recommendations.
i) Estimated remaining contribution, in years (<10, 10+, 20+, 40+);
j) Category U or A to C grading (see 4.5) to be recorded on the survey plan.

Relevant details of shrub masses, hedges, hedgerows and stumps are expected to have been recorded during the topographical survey but should be checked by the arboriculturist for inclusion in the tree survey. In the case of regularly maintained domestic hedges and the majority of shrub masses, it will normally be sufficient to record the height and species on the tree survey plan or note these in the schedule.

4.3 Tree Categorization Method

The purpose of the tree categorization method, which should be applied an arboriculturist, is to identify the quality and value (in a non fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained in the event of development occurring.

For a tree to qualify under any given category, it should fall within the scope of that categories definintion (U, A, B, C) and, for trees in categories A to C, it should qualify under one or more of the sub-categories (1, 2, 3). Sub-categories 1, 2 and 3 are intended to reflect the arboricultural and landscape qualities, and cultural values, respectively.

When categorizing a tree, the presence of any serious disease or tree-related hazards should be taken into account. If disease is likely to be fatal or irremediable, or likely to require sanitation for the protection of other trees, it might be appropriate for the trees concerned to be categorised U, even if the otherwise have considerable value. If structural defects are remediable, including the effect that this might have on the trees remaining value, will influence whether the tree be assigned to the category that it would otherwise merit.

Particular care is needed when evaluating young trees, especially where they occur as individual specimens. Where these are less than 150mm stem diameter at 1.5m above adjacent ground level, it might be acceptable and relatively straight forward to mitigate their loss, if necessary, with similar new tree planting. Alternatively, it might be practicable to relocate such trees within the site (e.g. using a tree spade). Whilst the presence of young trees of good form and vitality is generally desirable (i.e. those trees which have the potential to develop into quality mature specimens), they need not necessarily be a significant constraint on the site’s potential.

NOTE It is sometimes possible to relocate mature trees. However as this is a costly and complex operation with a variable chance of success, it is a viable option only in exceptional cases.

The tree survey might identify the presence of veteran trees on the site. The implications of their presence on the use of the surrounding land should be taken in the design process. Where such trees are to be retained, particular care should be taken in the design to accommodate them in a setting that aids their long term retention.

NOTE Whilst veteran trees typically a range of niche habitats, they are especially valuable if ancient, due to their scarcity and high habitat values for associated species of fungi, lichens and saproxylic invertebrates, including some which are rare or endangered and occur only where such trees have been continuously present for centuries. These trees will therefore almost always be included in the A3 category.

4.4 Soil Assessment

A soil assessment should be undertaken by a competent person to inform any decisions relating to:

- The root protection area RPA;
- Tree protection;
- New planting design; and
- Foundation design to take account of retained, removed and new trees.

The assessment should determine whether the soil is shrinkable. If it is, trees and other vegetation have the potential to cause indirect damage to structures. In such cases, desiccation assessments should be carried out at a specialist laboratory to check the extent to which existing vegetation has dehydrated the soil.

Soil structure, composition and pH should be included in the assessment for the purpose of designing new planting and landscape proposals.

4.5 Tree Protection Plan

The tree protection plan should be superimposed on a layout plan, based on the topographical survey and showing all hard surfacing and other existing structure within the RPA.

The plan should clearly indicate the precise location of the protective barriers to be erected to form a construction exclusion zone around the retained trees. It should also show the extent and type of ground protection, and any additional physical measures such as tree protection boxes, that will need to be installed to safeguard vulnerable sections of the trees and their RPAs where construction activity cannot be fully or permanently excluded.

These details should be incorporated into relevant subsequent drawings issued for use on the site, to ensure that all interested parties are fully aware of the areas in which access and works may or may not take place.

4.5 Arboricultural Impact Assessment

This assessment should take account of the effects of any tree loss required to implement the design, and any potentially damaging activities proposed in the vicinity of retained trees. Such activities might include the removal of existing structures and hard surfacing , the installation of new hard surfacing, the installation of services, and the location and dimensions of all proposed excavations or changes in ground level, including any that might arise from the implementation of the recommended mitigation measures. In addition to the

impact of the permanent works, account should be taken of the buildability of the scheme in terms of access, adequate working space and provision for the storage of materials, including topsoil.

As well as an evaluation of the extent of the impact on existing trees, the arboricultural impact assessment should include:

a) The tree survey;
b) Trees selected for retention, clearly identified (e.g. by number) and marked on a plan with a continuous outline;
c) Trees to be removed, also clearly identified (e.g. by number) and marked on a plan with a dashed outline or similar;
d) Trees to be pruned, including any access facilitation pruning, also clearly identified and labelled or listed as appropriate;
e) Areas designated for structural landscaping that need to be protected from construction operations in order to prevent the soil structure being damaged;
f) Evaluation of impact of proposed tree losses;
g) Evaluation of tree constraints and draft tree protection plan
h) Issues to be addressed by an arboricultural method statement where necessary in conjunction with input from other specialists.

5 Site Description

The vast majority of the trees are concentrated adjacent to the highway and give the impression that the original planting was utilised to form a boundary line that also consists of a privet type hedge that the landowner is looking to remove and replace with a close board fence. This area has a heavily planted understory consisting of *Prunus* and *Ilex* that are beneath 75mm in diameter and as such have not been included in the tree survey schedule.

It is understood that a tree preservation order No9 1989 covers a number of the trees, referred to within the order as G1. These are six Sycamore, Ash, Poplar, Rowan, Holly, 2 Prunus, Walnut, Purple maple, Purple leaved plum, and a Birch. Within the grounds we have only managed to identify five of the six sycamore, no poplar, walnut or birch. There are several hollies, none of which are of a size that would be consistent with being on the order, with a single sycamore (T 11) at the rear of the property that is of a size and age, that it would be highly unlikely it was included on the preservation order. As this Tree preservation order is not listed as a woodland order, any trees that are not included in the species list are not protected and no application is needed for their removal or management.

6 Tree Survey

Tree Number	Name	Diameter	Rpa	Height	Notes
T1	*Acer pseudoplatanus*	967mm	11.6 m	22 m	Some un-occluded pruning wounds to the east.
T2	*Acer pseudoplatanus*	520mm	6.24 m	17 m	Tar spot. Some un-occluded pruning wounds to the east.
T3	*Acer pseudoplatanus*	540mm	6.48 m	19 m	Some un-occluded pruning wounds.
T4	*Acer pseudoplatanus*	657mm	7.88 m	19 m	Tar Spot
T5	*Acer pseudoplatanus*	967mm	11.6 m	18 m	Tar spot.

Please note we have not included the crown dimensions as the relevance of these for the construction of a close board fence has been deemed irrelevant.

A full arboricultural report has been commissioned by the home owner, which has outlined the requirement for the removal of limbs that are overhanging the highway, as per a letter sent to the homeowner by South Holland District Council, and as such the crown clearance and first significant branch heights will have changed prior to construction.

An application for this, and other work has been lodged with South Holland District Council via the planning portal.

Tree species beneath the Sycamore trees have not been included as the average diameters are beneath the 75mm at 1.5 metres cut off set out in BS5837:2012.

8 Tree Removal

While not strictly defined as a tree, to facilitate the installation of the proposed fence, the privet hedge that forms the natural border of the property will have to be removed. This hedge has suffered from a lack of management for many years and has recently been cut back, under instruction of South Holland District Council, to allow full use of the footpath. This has left the hedge sparse and lacking in depth while still “overhanging” the footpath in places.

There may be the requirement for removal of some of the understory beneath the protected sycamore trees however these species cannot be confirmed until the actual position of the fence has been confirmed.

9 Tree Protection Barriers

Although normally a pre-requisite for retention of trees on construction sites, in this case the use of traditional style tree protection barriers is both impractical and unnecessary. An estimated forty percent of the rooting zone, that could suffer from the effects of compaction during and post construction, is beneath the paved foot path and highway. The proposed fence installation while requiring a form of excavation in the rooting area will not require the use of heavy machinery to facilitate its construction or installation and as such any potential for compaction or damage from striking will be minimal.

10 Soil Assessment

The landis soilscapes map describes the soil surrounding the area as *Loamy and clayey soils of coastal flats with naturally high ground water.* Soil samples taken on the day to a depth of 1 metre showed the soil to have a loamy texture that appeared to be well drained. Moisture content was low as we have been experiencing a prolonged period of hot dry weather. Ground compaction tests were carried out but gave inconsistent results as would be expected with the recent weather conditions and the soils current low moisture content.

Ph levels have been recorded across the site giving an average of 6.

11 Site Monitoring

As construction is to be carried out within the root protection area of these trees, in-line with BS5837:2012 it is recommended that an arboriculturist be present when excavation activity is carried out.

12 Conclusion and Recommendations

Lower limb pruning works should be carried out on T1, T2, T3 and T5 to allow uninhibited large vehicular movements along New Road and prevent mechanical damage to these limbs from vehicular striking. Previous pruning works have been carried out by the contractors on behalf of the utility company responsible for overhead line maintenance and this has created a clear gap in the lower canopy that can be used to create the “cut off point” for these works.

T5 will require the removal of the garden waste/detritus that has been placed at its base, along with the soil build up on the southern side to prevent any preventable degradation of this tree.

A full arboricultural report on all of the trees at this property, has been commissioned and provided to the home owner, which has outlined the requirement for the removal of limbs that are overhanging the highway, as per a letter sent to the homeowner by South Holland District Council; As such this work has already been applied for via the planning portal and the recommendations included only to provide a consistent, full picture of the works required irrespective of the proposed planning application for the construction of the new boundary fence.

As previously mentioned while not strictly defined as a tree, to facilitate the installation of the proposed fence, the privet hedge that forms the natural border of the property will have to be removed. This hedge has suffered from a lack of management for many years and has recently been cut back, under instruction of South Holland District Council, to allow full use of the footpath. This has left the hedge sparse and lacking in depth while still “overhanging” the footpath in places. To allow full unimpeded pedestrian usage the hedge line will have to be further reduced in depth and in some places completely removed further reducing the visual amenity value to a point where it can no longer be considered a hedge line.

Although construction is to be carried out inside of the root protection area, as the work will mainly be manual excavation of post holes, with the manual installation of posts any detrimental effects to the retained trees will be marginal.

With careful consideration to the position of the post holes to prevent severance of any major roots, with all construction materials stored outside of the trees rooting area alongside a suitably worded condition to ensure that excavation works are carried out under supervision of an arboriculturist then the proposal can be implemented without any long term detrimental damage to the retained trees.

Site Illustration with Tree numbers marked.

Not to scale.



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