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APPENDIX C5
Arboricultural Assessment

Final Arboricultural Survey & Development Report

National Football Centre. Proposed Hotel, Sports Facilities and Associated Development

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Arboricultural Survey Report

1.0 General Site Information

| | |
|-------------------|--|
| Site Address | FA – National Football Centre, St. George’s Park (formerly Byrkley Park) Burton |
| Site Proposal | Proposed Hotel Sports Facilities and Associated Development |
| Site Designations | Non Specifically Designated Site contains a large number of potentially nationally important ‘Veteran Oak tree. |

2.0 Abstract

Dryad Tree and Woodland Consultancy Services were commissioned with the brief to undertake a full Arboricultural survey within the defined areas of the site, working in compliance with the survey and report criteria set out within BS 5837 ‘Trees in relation to construction’ (2005).

The survey criteria was to assess the overall condition of both the individual ‘stand alone’ trees, and those trees located within the larger woodland block, in order to assess their suitability for long term retention within and adjacent to, the proposed hotel and sports centre facilities and its associated infrastructure.

The report was to comment on:-

- 1 The overall condition of the individual trees within the designated site areas, commenting on their condition and suitability for long-term retention on the site.
- 2 To make recommendations, where appropriate, on any remedial tree surgery work that would be required if the outlined design were to be constructed as suggested.
- 3 To make recommendations on the necessary tree protection requirements that would need to be implemented prior to the commencement of any construction work, in order to ensure that those trees designated for retention are appropriately protected during all phases of the construction work.
All tree protection recommendations are in line with BS 5837 ‘Trees in Relation to Construction’ (2005) requirements.
- 4 To make recommendations on the management criteria that would need to be implemented to ensure that the ‘veteran’ trees that are located within the defined area are appropriately managed and protected.

The survey was to be a visual inspection only and undertaken from ground level. Therefore, any statements made regarding the potential extent of any areas of decay, either at ground level or within a tree’s upper crown, have only been implied, and can therefore only be taken as an indication of a trees structural health. There may, as a result of the visual observations, be a necessity to undertake additional investigative work to determine the extent of any areas of decay identified at this stage.

The survey methodology was undertaken in accordance with current industry ‘Visual Tree Assessment’ (VTA) techniques.

All recommendations expressed within the survey conclusions are based purely on the condition of an individual tree, and have been made irrespective of any construction proposals for the site

All tree protection recommendation is in line with BS 5837 'Trees in relation to construction' (2005)

3.0 General Observations & General Survey Conclusions

There are a total of 78 trees contained within the identified boundaries of the Hotel & Sports Centre. These comprise:-

| | |
|--------------------------------|--|
| Trees 4820 and 4892 | 2 x Veteran Oak Trees |
| Trees 4821 – 4891& 4897 – 4898 | 72 x Woodland Trees, comprising predominantly of Oak, Hawthorn, with the occasional Holly and Silver Birch |
| Trees 4893 – 4895 | 3 x Individual trees within an area of scrub grassland |
| Tree 4896 | 1 x 'stand alone' Ash Tree. |

3.1 Veteran Oaks – General Site Observations

The two Veteran Oaks trees, as classified within 'Natural England's' terminology for 'veteran' trees, form just a fraction of the Veteran Oak trees contained within St. George's Park. Veteran trees are a very rare commodity, so to have a collection of so many trees within a small localised area, potentially makes the St. George's Park site of national importance, and should duly be recorded within the 'veteran' tree register.

It has been estimated that some of the trees within the St. George's Park site may be in excess of 600-800 years of age, and even through some are now 'standing dead' they remain of considerable ecological as well as historical importance, and should be retained on the site.

Although outside of the initial remit for the project, it is strongly recommended that a full survey, both Topographical and Observational, be undertaken to plot and record the condition of all of the 'veteran' trees within the site. In order that full provision can be made for their long term management.

For it is considered, that through the proposed development of the site, and the inevitable increase in public access, there will be greater pressures placed upon these historical and ecologically important trees, both in terms of public safety considerations and the impact that increased access will have on their long term futures.

3.2 Veteran Oak Trees

Trees 4820 & 4892

The two identified trees are of a condition conducive with their incredible age, and as such, areas of deadwood, fracture stubs and cavity development, both within their crowns, main stems and major scaffold branches are evident. The trees appeared to be actively growing and are establishing good bud development, an indication that they are potential in a healthy condition, bearing in mind their showing a slowing declining state of health. It is recommended that all of the trees, should be re-inspected during the summer of 2010, in order to obtain a fuller picture of their overall health.

It is an accepted view that veteran trees, can, if conditions allow, go through many hundreds of years of slow decline before their eventual death. There will then follow a further period of decline, actively decaying before they final disappear entirely. It is stated that through every stage of decline, the trees offer important habitats for bats, birds, insects and invertebrates.

It is therefore the presence of these areas of decay and the habitat value that they create, that make veteran trees of such considerable ecological as well as historical value. It is therefore recommended that these two trees should be retained on the site, free from active management, and protected in such away, as to allow their continued natural slow decline free from the public health and safety pressures.

3.2.1 Recommendations

It was apparent that the trees appear to have coped well with the alterations that have occurred in recent years to their localised environment, and as such it is recommended that a 'None Intervention' management strategy continue to be employed around these two trees. It is recommended, that this should comprise of the construction of a post and rail fence erected at a distance of 1.5 times tree height, or at their maximum 'Root Protection Area' (RPA) requirements, as specified by BS 5837 (2005), which ever is the greater distance.



Tree Number 4820
 Veteran Oak located towards the northwestern corner of the woodland.
 It is recommended that a post and rail fence be constructed around the tree at a distance of 1.5 times tree height to create a total exclusion zone, to encourage the development of 'natural regeneration' of a known provenance. Due to the close proximity of the road, this will not be feasible on the trees western side.



Tree Number 4892.
 Stand alone Veteran Oak located within an area of semi rough grassland.
 It is recommended that a post and rail fence be constructed around the tree at a distance of 1.5 times tree height to create a total exclusion zone, to encourage the development of 'natural regeneration' of a known provenance

3.2.2 Recommended distances for the construction of post and rail fencing around the two 'veteran' Oak trees.

Reference to Tree No 4820.

It is accepted that the recommended clearance distance may not be achievable on its western side, due to the existence of an access road.

| Tree Number | Stem Diameter | Tree Height | Root Protection Area. Metre Radius | Recommended Location of permanent fencing |
|-------------|---------------|-------------|------------------------------------|---|
|-------------|---------------|-------------|------------------------------------|---|

| | | | | |
|------|-----|----|-------------|---------------------|
| 4820 | 107 | 14 | 10.7 Metres | 21 Metres from tree |
| 4892 | 127 | 14 | 12.7 Metres | 21 Metres from tree |

It is considered that the construction of a permanent fence would create a protected area, free from grazing animals and mechanic grassland machinery within which natural regeneration would be encouraged.

It is however stated that any developing natural regeneration may need to be ‘supported’ through the use of tree guards and/or weed suppression control to enable their long term development.

Through the encouragement of natural regeneration, the historical ‘provenance’ of the trees can be retained.

In addition, the construction of fencing around the trees, augmented with clear signage and ‘interpretation boarding’ would assist in the protection of the public from any natural limb loss, as falling branches would be fully contained within the dedicated areas. Thus helping to remove any the requirement for direct tree management intervention, tree surgery work which would have a detrimental affect on the trees.

It is recommended that ‘Interpretation’ boards be designed to explain the importance of the veteran trees, the importance of the management criteria being implemented, as well as the necessity for public access round the trees to be fully restricted.

As indicated within the survey data sheets, the veteran Oaks should be managed in accordance with veteran tree management policy, a management policy that is individually tailored to the specific requirement of the tree.

In all cases the preservation of deadwood, both within and beneath a tree’s canopy, is of considerable importance, as it not only provides valuable habitats for invertebrates, but once on the ground, its slow disintegration provides valuable nutrients which can be re-cycled back into the tree, providing a fresh energy reserve, and thus perpetuating the trees natural life cycle.

3.3 Woodland Trees

Tree Numbers 4821 – 4891 & 4897 – 4898

Reference Arboricultural Survey Data Sheets

The 62 trees contained within this visual dominant part of the site comprise predominantly of ‘even-aged’ English Oak (*Quercus robur*), with a sparse under-story layer of Hawthorn (*Crataegus monogyna*) and the occasional Holly (*Ilex aquifolium*), Silver Birch (*Betula pendula*) and Goat Willow (*Salix caprea*). The trees in general can best be described as being in a ‘good’ overall condition, although there are a few individual trees that are in a poor state of health and should be removed.

The woodland trees are located on an area of gently sloping ground around what appears to be a ‘seasonal’ wetland area. It was observed, that due to the close proximity of the trees to each other, those trees located around the edge of the woodland copse have developed with asymmetrical crowns, where as those trees wholly located within the copse had narrower more ‘light drawn’ crowns.

In additional to a small number of trees recommended for removal based on their poor and declining overall condition, the greater majority of the dominant woodland trees contain varying amount of deadwood, fractured and part fractured and hanging limbs within their crowns (Ref Arboricultural Survey).

It is considered, that whilst this particular part of the site has limited usage, there would not appear to be the necessity to undertake anything more than the removal of the major crown faults, i.e. major deadwood and the major fractured hanging limbs.

However, should the development of the hotel and sports complex be constructed as proposed, there would be a considerable increase in public access pressures both within and surrounding the woodland, access that would necessitate a far greater emphasis needing to be placed on public health and safety requirements, than currently exist.

The woodland's under-story generally comprises of Hawthorn, scrub Elderberry, occasional Holly and Bramble development, and with the exception of two young Oak trees, there is no significant natural regeneration of any tree species occurring.

The absence of any regeneration is of concern, for although the woodland trees could have potentially 50-100 years of remaining life, it would be advantageous to observe natural regeneration, as this would indicate that the trees are producing viable seed.



General view of the western side of the woodland area.

3.3.1 Recommendations

Current and future woodland and tree management proposals will need to be based on the level of current and proposed public access pressures.

In the event that planning permission is granted for the hotel and sports centre development, there will inevitable be far greater public access pressure place upon the woodland than currently exist, as the woodland will be adjoined on all four sides by access roads, car parks and the hotel complex.

It is therefore recommended that due to the woodlands close proximity to the complex there will be a necessity for the implementation of extensive remedial tree surgery works to all trees, to remove all deadwood, fractured and hanging branches.

It is further recommended that the woodland trees become the subject of a rolling re-inspection programme, in order that their health can be regularly assessed.

It is further recommended that additional under-story work be implemented, through the management and control of the 'Bramble' and Elderberry, and through the 'light' scarification of the ground surface to encourage the development of 'natural regeneration' from the dominant Oak trees.

It is suggested that the implementation of tree planting works should introduce St. George's Park' 'provenance' trees. However, should natural regeneration not be forthcoming, consideration could be given to either:-

- 1 The collection of acorns from other existing trees within the St. George's Park estate and the contract growing on and subsequent re-planting back onto the Park.
- 2 The careful lifting, transplantation and subsequent aftercare of natural Oak regeneration from other parts of the estate.

Individual trees within an area of scrub grassland

Trees Numbers 4893 – 4895

Reference Arboricultural Survey Data Sheets

The three trees located within this area comprise of

| | | |
|-----------|----------------|---------------------------|
| Tree 4893 | Hawthorn Group | <i>Crataegus monogyna</i> |
| Tree 4894 | Beech Tree | <i>Fagus sylvatica</i> |
| Tree 4895 | Silver Birch | <i>Betula pendula</i> |



A general view of the three trees, The photograph clearly indicates the structurally poor condition of the Beech tree.

The three trees within this part of the site are located within an area of rough scrub grassland and appear to have established adjacent to the remnants of an old boundary metal railing fence line.

It is suggested that both the Hawthorn and Silver Birch trees have developed as a result of natural regeneration, whereas the Beech tree may have once formed part of the original Byrkley Park landscape, as it has been estimated as being approximately 120-150 years of age.

3.4.1 Reference:- Beech *Fagus sylvatica*

It is considered, that although this tree is of a mature age, and may once have formed part of the original Byrkley Park landscape, general observations indicate that the tree is in a very poor and declining state of health, and as such can only be considered as having a very limited life expectancy.

It is apparent that the tree has suffered major structural limb loss on its northern side, resulting in the loss of approximately 50% of its crown. It was further apparent that decay had become established within the resultant wounds and throughout the tree's main stem, further reducing the structural integrity of the tree's remaining major limbs.

It is therefore concluded that this tree is in a state of terminal decline and has a very limited life expectancy, and could suffer imminent failure of its remaining limbs and crown sections.

3.4.2 Hawthorn Group & Silver Birch

The remaining two trees comprise of a Hawthorn and Silver Birch, the development of which is considered to be the result of natural regeneration. It is suggested that although the Hawthorn provides nesting habitat, neither of the remaining two trees is of any major significant aesthetic value.

3.5 Individual Ash Tree Tree 4896

Reference Arboricultural Survey Data Sheets

This visually prominent Ash tree is potentially between 100-150 years of age, and is located as a stand alone tree within an area of rough scrub grassland.

The tree's main stem shows two large fracture wounds on its western and southern sides, both of which are located at approximately 5 metres. It is considered that the large wounds are the result of historical co-dominant and/or major lateral limb failure. It is apparent that the resultant wounds exhibit symptoms indicating the presence of internal decay and cavity development. It is anticipated that a large central column of decay/decay staining may have occurred within the tree's main stem, the result of which may have a potential influence on the trees long-term structural stability. The trees upper crown show evidence of additional limb failure wounds with the potential for additional areas of decay to be present.

It is suggested that the overall condition of this tree suggests the potential for numerous 'bat roosts' to be present, although the evidence did not definitively confirm current bat habitat occupation.

It is considered that due to the trees age, historical storm damage and its exposed location, there is the potential for further storm damage to be inflicted, especially given that the tree has several long exposed lateral limbs.



Tree Number 4896.
The photograph clearly shows the large wound on the northern side of the trees stem, as well as the upper crown fracture wounds.
It is considered that retention of this tree is not viable within an area of high public access, due to its poor and declining condition

3.5.1 Recommendations

It is recommended that the trees long-term retention potential and any subsequent management recommendations need to be balanced with regard to future site proposals that may eventually surround the tree. Based on the trees current condition, location and surrounding land management, it is suggested that although there are several areas of potentially significant decay within its main stem and major scaffold branches, its age, location and condition, potentially makes it a valuable wildlife habitat resource, especially with

regard to 'bat' habitats or Owl nesting sites. It is therefore suggested that, from a landscape and wildlife habitat perspective, the tree warrants the undertaking of remedial tree surgery work to rectify and reduce the potential for further major limb failure, through the undertaking of a carefully planned crown reduction programme that will reduce the crowns physical weight and its foliage 'sail' area.

It is recommended that the proposed crown reduction work could be undertaken with the view of increasing the trees wildlife habitat value, through the use of planned 'tear' and/or 'coronet' cuts. The use of which tries to 'mimic' natural limb failure, and produce wounds that are planned to 'rot' thus providing habitats that may eventually be colonised by the local wildlife.

It is accepted that future land management operations may place the tree in close proximity to buildings, roads and/or high areas of pedestrian access. Should this become the case, a review of the trees condition would need to be undertaken, with potential changes made to the trees management criteria in view of the changes to the surrounding land use.

Arboricultural Impact Assessment

4.0 Hotel & Sports Centre Complex Site Plan National Football Centre St George's Park Proposed Site Plan 09 003 Version F

The proposals for the site, as indicated within the supplied site plan, indicate the construction of a new hotel and sports centre, the construction of car parking areas, the extension of an existing access road and the construction of all associated infrastructure. The construction of which could potentially have an impact on the health and longevity of a number of the trees within this portion of St. George's Park.

4.1 Abstract

The specified purpose of an Arboricultural Impact Assessment is to assess the proposed design from an Arboricultural perspective, and to comment on the potential impact that the development may have on those trees designated for retention. In addition, it is to make recommendations, where appropriate, on design alterations and/or construction methodologies that could be implemented to mitigate for the potential tree related damage.

5.0 Construction Impact Observations & Recommendations Reference Site Plan 09003 Version F

The proposed design indicates that the buildings construction and its associated infrastructure will have a potential impact on a small number of the trees within the designated construction area, and will necessitate the remove of a small number of trees.

Trees to be removed to facilitate the construction of the proposed complex

| | |
|-----------|--|
| Tree 4893 | Hawthorn Group |
| Tree 4894 | Mature Beech tree in a declining and structurally poor condition |
| Tree 4895 | Silver Birch |
| Tree 4896 | Dominant Ash tree with inherent structural weaknesses and areas of decay development |

Trees which may be directly affected as a result of road construction impact.

| | |
|-----------|--------------|
| Tree 4820 | Veteran Oak |
| Tree 4846 | Woodland Oak |
| Tree 4848 | Woodland Oak |
| Tree 4851 | Woodland Oak |
| Tree 4852 | Woodland Oak |

Trees potential affected by the car parks construction

| | |
|-----------|--------------|
| Tree 4865 | Woodland Oak |
| Tree 4867 | Woodland Oak |
| Tree 4871 | Woodland Oak |

The proposed construction of the Security Gatehouse and associated road widening works at the site's entrance will potential have an effect on three trees, reference Tree Nos. 1630, 1651 and 1652.

It is however stated that observations taken of these trees indicate that two, Tree No 160 and 1652, are in a poor and declining condition, and irrespective of the implementation of the proposed construction activities, should be felled, as they constitute a potential threat to the existing roadway, and therefore to site visitors. It is recommended that these trees be felled

as a matter of urgency, with their loss mitigated for through the implementation of a one for one re-placement scheme.

It is considered that as the new road alignment rejoins that of the existing alignment adjacent to Tree No 1651, the potential for construction related root damage should be minimal, provided that adequate tree protection is installed prior to commencement of construction activities.

It is stated, that although the road and gatehouse's construction can be undertaken without having any detrimental effect on the single remaining tree, there will be the potential for root damage to be caused during the installation of any underground services. It is therefore stated, that any new underground trenching operations, that run through the identified root protection areas of any trees, must be undertaken in accordance with BS 5837 (2005), and must be supervised and undertaken utilising 'hand digging' techniques, thus enabling all roots with a diameter greater than 10mm to be retained.

5.1 Trees To Be Removed

It is apparent from the design that the location of Tree Numbers 4893-4895 places them roughly centrally between the two main building and partly within the proposed new access road.

As indicated within the Arboricultural Survey, this group of trees, which comprises of a Hawthorn Group, a mature Beech tree which is in a structurally poor and significantly declining condition and a Silver Birch tree, are all of generally of poor quality and do not warrant retention within what primarily would be a visually prominent location.

It is considered that although the Hawthorn does provide valuable nesting opportunities, it has no intrinsic aesthetic value, further more, the adjacent Beech tree is in a structural very poor condition, and would constitute a major public safety hazard if retained.

It is therefore recommended that all three trees should be removed and their loss mitigated for through the implementation of an appropriate landscape design scheme.

5.1.1 Dominant Ash tree Tree No 4896

As indicated within the Arboricultural survey, this tree has suffered major limb loss in recent years, resulting in wounds into which decay has becoming established.

It is considered, that based on the trees overall condition, its retention in close proximity to the new buildings and the perimeter road would place additional 'stress' on the tree, potentially resulting in an acceleration of its decline, with all of the potential health and safety considerations that would entail.

It is stated that whilst retention of this tree has been recommended within the Arboricultural survey, its retention criteria was based solely on its setting and condition at the time of inspection.

6.0 Trees To Be Retained. The Woodland Trees

The proposed design indicates an extension and up-grading of the existing access road, to facilitate a direct vehicle access to the hotel and its associated car park areas. The construction of which appears to slightly encroach within the designated 'Root Protection Areas' of some of the woodland edge trees, and as a result there would be the potential for some root damage to be inflicted upon the identified edge trees.

6.1 Veteran Oak Tree No 4820

It is considered that due to the proximity of this Veteran Oak to the existing section of road, there may have been the potential for some minor physical root damage to have been

inflicted upon it during the road original construction. As its designated 'Root Protection Area' (RPA) slightly encroaches within the existing access road to the west of the tree.

It is however suggested, that any construction related root damage inflicted during the roads construction would have been unlikely to have had a significant effect on the overall health of the tree. Further more, and by way of substantiating the above statement, the current BS 5837 'Trees in relation to construction' (2005) criteria, permits a reduction of a tree's RPA spread by up to 20%. Providing that it only occurs on one side of the tree and that there can be a corresponding increase on the other three sides, which in this instance can clearly be achieved.

It is therefore considered that, as the construction of the existing access road is unlikely to have resulted in any significant root damage, any road up-grading work, providing that it does not encroach any closer to the Veteran Oak than the existing road edge and that adequate and appropriate tree protection measure are installed prior to the implementation of road construction activities, there should not be the potential for any physical root damage to be inflicted upon this tree.

It is further stated, that should there be a requirement for any road re-alignment/widening activities to be undertaken, its alignment on its eastern side must remain constant with the existing alignment, with any road alterations being accommodated in its western side. Thereby ensuring that any potential for road construction encroachment within the designated RPA of this veteran Oak tree is negligible.

7.0 Tree Protection

It is stated that prior to the commencement of any road construction/alignment activities, protective fencing of a design as specified within BS 5837 (2005) must be constructed within 1 metre of the eastern edge of the road. It is accepted that the sighting of the fence in this location does not fully enclose the trees RPA requirements, but it will limit the spread of any road construction activities, thereby ensuring that both construction traffic and the storage of construction materials does not encroach within its designated RPA requirements of this important tree.

7.1 The Woodland's Southern Boundary Encroachment over the New Access Road.

Reference:- Tree Nos. 4846 & 4848
SK 20.01.10 SWG.04

As with the comments made concerning Tree 4820, the BS 5837 (2005) criteria allows for a reduction within a trees RPA by 20% in one direction only. If this criteria were to be implemented within this area, it would reduce the trees RPA requirements to a point where they no longer encroached within the proposed new road alignment.

However, although the roads physical encroachment within the designated RPA can be mathematically removed, the physical crown spread of the trees can not, with out the implementation of physical tree surgery work, work that would potentially have a detrimental effect on the physical aesthetics of the two identified trees.

It therefore recommended that the road should be re-aligned to ensure that its physical construction falls outside of the Root Protection Areas requirements and crown spreads of both of these trees, with a further 1 metre of additional clearance added to ensure that the required protective fences can be constructed along the line of the identified RPA's. Thereby ensuring adequate physical road construction room between the proposed road edge and the protective fences.

7.2 The Woodland's Eastern Boundary Encroachment over the Car Park Area.

Reference:- Tree 4865 – 4871
SK 20.01.10 SWG.05

The identified section of car park falls generally immediately adjacent to the edge of the identified RPA's for this group of trees, and as such, there should be no direct physical impact on the trees.

It is however observed that crown spread encroachment from Tree No 4867 occurs over a couple of the parking bays, and as a result, there may be a requirement for some minor additional pruning work to be undertaken to ensure adequate crown height clearances over the car park.

As with all construction work in close proximity to trees, there will be a necessity for a protective fence to be constructed in accordance with the specifications set out within BS 5837 (2005), with the fencing constructed along the line of the tree's RPA requirements.

8.0 Tree Protection Measures

General Note

The tree's rooting system is probably the most susceptible area to damage, but unlike those parts of the tree above ground, which can be seen and therefore protected, the roots are invisible and generally ignored. Additional misconceptions about rooting depth and design increase their risk of damage. "The majority of the root system is in the surface 600mm of the soil, extending radially for a distance frequently in excess of the height of the tree" (BS 5837 : 2005)

The death of or damage to a tree's root system can have long term implications on the safety, health, stability and life expectancy of the tree. The damage caused during construction work generally only becomes evident within the visible parts of the tree after several years, when the initial damage has predisposed the tree to an increase in 'Stress' as well as attack from a variety of decay pathogens, all of which result in a decline in the health and stability of the tree, with all the public safety implications that entails.

The avoidance of damage to the rooting system will better enable the tree to adjust to the new environment created by the development. In order to achieve this it is essential that during the period of the development, protective fencing is constructed around the tree prior to any construction work or the delivery of any materials, machinery or site huts to the site.

9.0 Tree Protection

The fence should to be constructed prior to any work being undertaken on the site and once erected should be considered as sacrosanct. They should not be removed during any phase of the construction work without prior consultation with an Arboricultural consultant. The construction of all protective fences should adhere to the specifications laid down within the BS 5837 2005 document.

The storage and mixing of all construction materials should be carried out at least 10 metres outside of the protection zone and well away from any watercourse, to avoid any possibility of any root or ground water contamination from construction related toxic substances.

In order to ensure that no additional root damage is caused to any of the trees, all excavated spoil resulting from foundation excavation work should be deposited within specifically determined holding areas well away from any trees.

Under no circumstance should any fires be lit on the site within 20 metres of any of the trees.

It is recommended that the erection of a continuous fence line be installed around the entire boundary of the woodland and around the retained 'veteran' Oak tree to form a positive and permanent demarcation line between the development area and woodland to ensure that construction/material storage activities do not migrate into the area.

It is further suggested that additional fencing be installed around the entire working site, to ensure that construction activities do not migrate into the greater landscape.

It is suggested that prior to the commencement of any construction activities on the site, the contractor will be required to compile a working methodology that clearly identifies the location of all site offices, materials storage compounds, site access roads, both onto and within the site, and other such working/storage compounds as he requires to facilitate the projects construction. These identified areas are to be approved by an Arboricultural consultant, prior to the finalisation of the working methodology, to ensure that there is no conflict with any trees designated for retention.

10.0 Tree Protection Monitoring Regime

It is recommended that an Arboricultural consultant be employed, as part of the management team for the project, to ensure the full adherence to the tree protection recommendations and to ensure that the required tree surgery work is undertaken to the approved standards.

It is recommended that site visits are made at relatively frequent intervals during the construction phases, and that a short 'tree protection seminar' is given to the site managers and operatives involved with the project prior to the commencement of all construction related activities.

It is recommended that site visits should be made at:

- 1 The commencement of the tree surgery work and again on its completion to ensure that the work has been undertaken to the desired standard.
- 2 Prior to the commencement of construction, to ensure that the protective fences are erected in the correct location and have been constructed to the appropriate specification.
- 3 At various times during the demolition and construction phases to ensure that the fences remain 'in situ' and thereby ensure that the ground around the trees is not being subjected to construction related activities.
- 4 On completion of the project, to ensure that the work has been undertaken with due regard to tree health, and to re-inspect the trees to ensure that they are in an undamaged state, and where necessary to recommend any remedial tree surgery work that may be required, if any of the trees have been damaged.

11.0 Tree Surgery Requirements

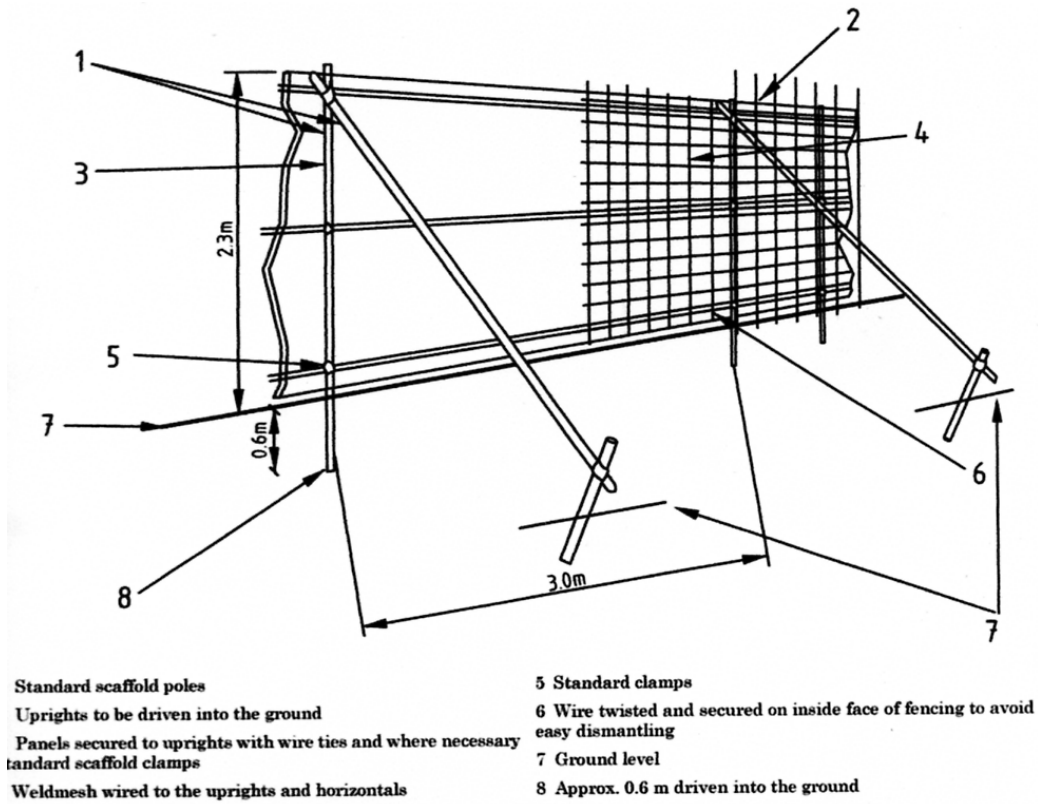
All tree surgery operations to be undertaken by a competent, fully trained and insured contractor capable of working in accordance within BS 3998 'Tree Works' (1989), or up-to-date 'best practice'.

Prior to undertaking of any tree removal or tree surgery activities on the site, a full ecological inspection will need to be undertaken to ensure full compliance with the wildlife and Countryside Act 1981, with specific regard to Bats and Birds.

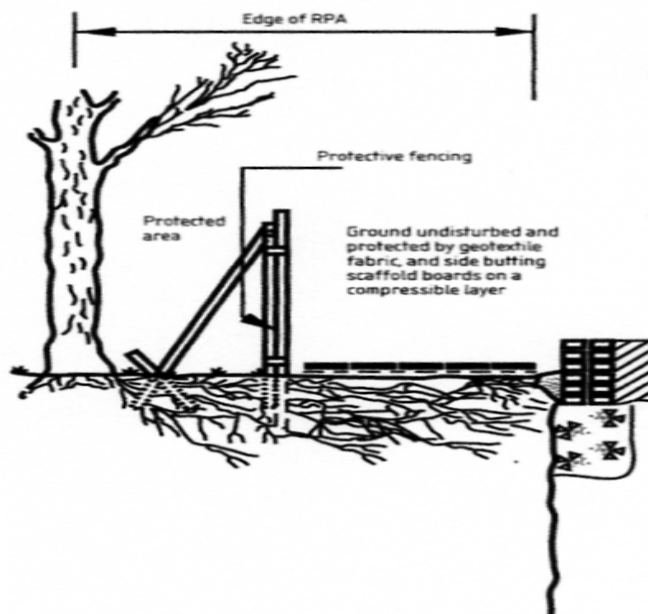
Dryad Tree & Woodland Consultancy Services are in a position to offer a professional contractual services fully capable of undertaking all of the recommended tree surgery and tree protection work.

We have also undertaken specific work on veteran tree management in both a consultancy and practical roll for Natural England.

12.0 Protective Fence Construction Specification
Figure 2



BS 5837 ‘Trees in relation to construction’ (2005) Figure 3. Protective fence construction specifications to be used in locations where construction work is to be undertaken on the extreme edge of a trees Root Protection Area (RPA)



13.0 Bibliography

British Standards Institute
BS 5837 'Trees In Relation To Construction'
2005

British Standards Institute
BS 3998 'Tree Works'
1989

Trees and Development
A Technical guide to preservation of trees during land development
Nelda Matheny and James R Clark
1998

Research for Amenity Trees No.4
The body language of trees
Clause Mattheck and Helge Breloer
1994

Research for Amenity Trees No.7
Principals of Tree Hazard Assessment and Management
David Lonsdale
1999

Trees in the Urban Landscape
Principals and Practice
Anthony Bradshaw, Ben Hunt and Tim Walmsley
1995

Arboricultural Survey Data Sheets & Definition Pages

Survey Definitions

| | |
|-----------------------|---|
| Plan Number | Corresponds number sequence on site plan drawing |
| Species | Defined in Latin |
| Tree Age | Expressed YM = Young Mature M = Mature OM = Over Mature V = Veteran |
| Height in Metres | Measured using a clinometer. |
| DBH in cm | Stem diameter measured at 1.5 Metres above ground level. Measurement taken in accordance with BS 5837 Trees in relation to construction (2005) criteria |
| Crown Spread | Approximate spread measured in metres. |
| Observations | <p>Root Condition The visual assessment of the rooting area, taking into consideration any evidence of physical damage, soil compaction, excavation work and/or drainage problems.</p> <p>Stem Condition The visual assessment of the stem and main scaffold branches Inspecting for visible faults and wounds, and exterior sign which may suggest the possibility of internal faults.</p> <p>Leaf & Bud The visual assessment of the amount and condition of foliage or bud development, when compared to the foliage of the surrounding trees of the same species.</p> |
| Recommendations. | The recommendations for any tree surgery work |
| B.S 5837 Categories | Trees in relation to construction (2005) Green Trees of high quality and value: Blue, Trees of moderate quality and value: Grey, Trees of low quality and value: Red, Trees for removal: |
| Root Protection Area. | Defined within BS 5837 Trees in relation to construction (2005) As “Layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree”, shown in plan form in either M ² or as a radius distance around each tree, depending on existing ground conditions and previous land management. RPA defined as M ² = Square Metres M R= Metre Radius around each tree |

Re-inspection programme

In all cases it is recommended that mature trees are inspection at least twice per year, just after bud burst to assess leaf condition and early Autumn to look for evidence of 'Decay Pathogens'.

Table 1 – Cascade chart for tree quality assessment

| TREES FOR REMOVAL | | | | |
|--|---|---|---|-------------------------------|
| Category and definition | Criteria | | | Identification on plan |
| Category R Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for the reasons of sound arboricultural management | <ul style="list-style-type: none"> 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 removal of other R category trees (i.e. 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 (e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality NOTE Habitat reinstatement may be appropriate (e.g. R category tree used a bat roost: installation of a bat box in nearby tree). | | | DARK RED |
| TREES TO BE CONSIDERED FOR RETENTION | | | | |
| Category and definition | Criteria – Subcategories | | | Identification on plan |
| | 1 Mainly arboricultural values | 2 Mainly landscape values | 3 Mainly cultural values, including conservation | |
| Category A Those of high quality and value: in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested) | Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue) | Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups) | Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture) | LIGHT GREEN |
| Category B Those of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested) | Trees that might be include in the high category, but are downgraded because of impaired condition(e.g. presence of remediable defects including unsympathetic past management and minor storm damage) | Trees present in numbers, usually as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals but which are not, individually essential components of formal or semi-formal arboricultural features (e.g. trees of moderate quality within an avenue that includes better, A category specimens), or trees situated mainly internally to the site, therefore individually having little visual impact on the wider locality | Trees with clearly identifiable conservation or other cultural benefits | MID BLUE |
| Category C Those of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150 mm | Trees not qualifying in higher categories | Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit | Trees with very limited conservation or other cultural benefits | GREY |
| NOTE Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150 mm should be considered for relocation. | | | | |

