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# Arboricultural Implications Report

# Proposed development at

# 4 Highfields Grove

# London

# N6 6HN

**February 2017**

Ref. SJA air 16318-01a

** SJAtrees is the trading name of Simon Jones Associates Ltd.*

## SUMMARY

S1. SJAtrees has concluded that the arboricultural impact of this scheme is of negligible magnitude, and that the proposed development would not have an adverse arboricultural impact on the character and appearance of the local landscape or the conservation area, or on the amenity or biodiversity that the existing trees provide; and accordingly, that it complies with national planning policy guidance and with local planning policies.

S2. Our assessment of the impacts on 23 individual trees, growing on or immediately adjacent to this site, concludes that no category ‘A’ or ‘B’ trees, no veteran or ancient trees and no trees of high landscape or biodiversity value are to be removed. None of the main arboricultural features of the site are to be removed. No hedgerows deemed to be “important” are to be removed. The proposed felling of the trees identified for removal will therefore represent no alteration to the main arboricultural features of the site.

S3. The proposed pruning is minor in extent, and accordingly will not detract from the character or appearance of the site, conservation area or local landscape.

S4. The incursions into the RPA of the English oak tree to be retained is minor, and subject to implementation of the measures recommended on the TPP and set out at **Appendix 2**, we consider that no significant or long-term damage to its root system or environments will result.

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## APPENDICES

# 1. INTRODUCTION AND BACKGROUND INFORMATION

## 1.1. Instructions

1.1.1. SJAtrees has been instructed by Novus Finitor UK Ltd. to visit 4 Highfields Grove, London N6 6HN and to survey the trees growing within and adjacent to this property.

1.1.2. We are further asked to identify which trees are worthy of retention within a proposed development of the garden; to assess the implications of the proposals on these specimens, and to advise how they should be protected from unacceptable damage during construction.

## 1.2. Scope of report

1.2.1. This report and its appendices reflect the scope of our instructions, as set out above. It is intended to accompany a planning application to be submitted to The London Borough of Camden, and complies with local validation requirements, and with the recommendations of British Standard BS 5837: 2012, *Trees in relation to design, demolition and construction – Recommendations* ('BS 5837').

1.2.2. The proposed development comprises the construction of a garden summerhouse with outside decking area within the garden of 4 Highfields Grove.

1.2.3. The report summarises and sets out the main conclusions of the baseline data collected during the tree survey, and identifies those trees or groups of trees whose removal would result in a significant adverse impact on the character or appearance of the local environment (Section 2). It then details and assesses the impacts of the proposals on trees, including which are to be removed (Section 3), or pruned (Section 4), which might incur root damage that might threaten their viability (Section 5);. These assessments are then summarised in Section 6, considered in relation to national and local planning policy, and our conclusions are presented. The methodologies used in the compilation of the report are set out at **Appendix 1**.

## 1.3. Site inspection

1.3.1. A site visit and tree inspection was undertaken by Tom Wawman of SJAtrees (the trading name of Simon Jones Associates Ltd.), on Friday the 11th November 2016. Weather conditions at the time were clear, dry and bright. Deciduous trees were in partial leaf.

## 1.4. Site description

1.4.1. The site is located at the end of a cul-de-sac branch of Highfields Grove, which is a private gated estate. The north, east and west boundaries adjoin other residential properties.

1.4.2. The site slopes down from the northwest towards the south east, and currently comprises a detached residential property with associated gardens and hard standing.

## 1.5. Statutory controls

1.5.1. At the time of writing we understand that none of these trees are covered by a tree preservation order (TPO).

1.5.2. The site is within the boundaries of the Highgate Village Conservation Area. The Character Appraisal for this area mentions trees and states that "**The trees within the Highgate Conservation Area are an important part of the local landscape and make an important contribution to the character and appearance.**"

1.5.3. There are no hedgerows within or abutting the site.

## 1.6. Non-statutory designations

1.6.1. There are no woodlands within or abutting the site that are classified as 'Ancient'. Ancient woodland, which is considered to be an important and irreplaceable habitat, is defined by Natural England as "land that has had continuous woodland cover since at least 1600 AD".

## 2. THE TREES

### 2.1. Survey findings

2.1.1. We surveyed a total of 23 individual trees and two hedges growing within or immediately adjacent to the property. Their details are found in the tree survey schedule at **Appendix 3**.

### 2.2. Assessment of suitability for retention

2.2.1. The main arboricultural feature within or immediately adjacent to the garden, whose removal we consider would have an adverse impact on the character and appearance of the local landscape, on amenity or on biodiversity, is:

- the individual English oak (no. 8), which because of its size and visibility contributes to the character of both the garden and the conservation area.

2.2.2. Using the tree categorisation method at Table 1 of BS 5837, no trees have been assessed as category 'U'.

2.2.3. There are no category ‘A’ trees but seven category 'B' specimens. The remaining 16 trees are assessed as category 'C', being either of low quality, very limited merit, only low landscape benefits, no material cultural or conservation value, only limited or short-term potential, or young trees with trunk diameters below 150mm; or a combination of these.

2.2.4. The two hedges have been assessed as category ‘C’.

## 3. TREES TO BE REMOVED

### 3.1. Details

3.1.1. The proposals, as shown on the proposed layout drawing, indicate that seven individual trees (nos. 1 - 7) are to be removed, either because they are situated within the footprint of the proposed development, or because they are too close to proposed structures or surfaces to enable them to be retained.

3.1.2. The English oak (no. 8) that forms the main arboricultural feature of the site, (as identified at paragraph 2.2.1), will not be removed.

3.1.3. The seven trees to be removed are category 'C'. None of the Category 'B' trees are to be removed. The trees to be removed are shown and listed on the TPP and at ***Table 1*** below.

| Tree no. | TPO No. | Species | Height | Trunk diameter | Age class | BS category |
|---|---|---|---|---|---|---|
| 1 | n/a | Sycamore | 18m | 660mm @ 1m | Mature | C (2) |
| 1-7 | n/a | Silver birch | 16m to 18m | 195mm to 320mm | Semi mature | C (123) |

***Table 1:*** **Trees to be removed**

3.1.4. None of the individual trees to be removed are covered by a TPO.

3.1.5. The two hedges (H1 and H2) are to be retained.

### 3.2. Assessment

3.2.1. The English oak (no. 8) that constitutes the main arboricultural feature of the site, and which makes the greatest contribution to the character and appearance of the local landscape, to amenity and to biodiversity (see paragraph 2.2.1), will be retained

3.2.2. Seven category 'C' trees are to be removed as detailed below:

- **Sycamore (no. 1):** Has a significant defect which will reduce its long-term potential: it is twin-stemmed from 1.5m with a tight compression fork with evidence of included bark and "elephant ear" protrusions of around 150mm in length,

indicating that a weak union is present at this point and is therefore at increased risk of failure. Acer (which includes sycamore as a species) is known to have a high propensity to form weak forks and is in the top ten common species with a propensity for failure of these forks[2]. This specimen is not readily visible from public views and is only visible from outside of the site in views from private gardens to the north and east. It has been assessed as being of low quality, only moderate landscape value and of short term potential.

Sycamore is a species that, for a number of reasons, is usually only suitable for rural locations or large estates, and is normally unsuitable for urban or suburban gardens. Consequently, it seldom achieves its genetic life expectancy in such locations.

Its potential size is a main reason why it is unsuitable. Sycamore can achieve heights in excess of 28m, and on good sites can grow very rapidly. Currently the tallest sycamore in the UK is 40m in height, and the stoutest has a trunk diameter of 2750mm[3]. For the first 80 years of life, the trunk may increase in girth by about 4cm per year, and trunks with diameters in excess of 1m are common[4]. Furthermore, mature sycamores tend to develop a large and densely domed crown, which in the open can often become broader than it is tall, with large and heavy low branches[5].

- **Silver birch (nos. 2 – 7):** A group of closely planted specimens which are drawn-up and mutually supressed as well as being suppressed and overtopped by the English oak (no. 8) to the south west of the group. There are fungal fruiting bodies present at the base of one of the trees (no. 3) which are consistent with honey fungus (*armillaria spp*.), and there is also a clump of honey fungus growing to the

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[2] DAVID LONSDALE: Principles of tree hazard assessment and management.

[3] MITCHELL, A. F., SCHILLING, V. E., and WHITE, J. E. J. (2003). Champion Trees in the British Isles. *Forestry Commission Technical Paper 7.*

[4] WHITE, J (1995) Forest and Woodland Trees in Britain.

[5] MITCHELL, A. (1996). Trees of Britain. *Harper Collins.*

east of the group. There is an area of decay at the base of tree no. 3 adjacent to the fungal fruiting bodies. Exudations and dark staining are present on the trunks of all the trees within the group. This group is largely obscured in views from outside of the site by other trees. When honey fungus is present in the roots or trunk it will lead to the decline and eventually the death of the affected tree; there is also an increased risk of wind failure in such specimens. Honey fungus is known to spread below ground and it is therefore likely that neighbouring trees will also be at risk of invasion and even when dead, the trees will provide a host for the fungus, enabling it to spread to other still live trees. Given the proximity of these trees to each other, it is likely the honey fungus has spread to the other trees within the group although no further fruiting bodies were present at the time of inspection. They have been assessed as being of low quality, of low landscape value, and of short-term potential only.

3.2.3. For the reasons given above, their removal will have no significant impact on the character or appearance of the area.

3.2.4. No trees subject to a Tree Preservation Order are to be removed.

3.2.5. Furthermore, the proposals incorporate replacement tree planting; as shown on the tree protection plan at **Appendix 5.** This will mitigate the proposed removals, and replace trees of limited potential with more suitable higher quality specimens. The establishment of the proposed replacement planting will progressively reduce the magnitude of the impact of the proposed removals on the character and appearance of the site.

3.2.6. In the light of these considerations, and taking account of the numbers, sizes and locations of the trees to be retained, the felling of the trees identified for removal will represent no alteration to the main arboricultural feature of the site.

# 4. TREES TO BE PRUNED

## 4.1. Details.

4.1.1. One tree is to be pruned to facilitate implementation of the proposals, as shown at ***Table 2*** below.

| Tree no. | Species | Proposed Works |
|---|---|---|
| 23 | Hazel | Reduce canopy on West side to 1.8m from trunk |

***Table 2:*** **Proposed pruning works**

## 4.2. Assessment

4.2.1. The extent of pruning proposed to the tree shown in ***Table 2*** is minor. Branches to be removed are small in size, and will result in a maximum wound size no greater than 50mm in diameter; this will have an insignificant effect on the health and physiological condition of these trees, and complies with the recommendations of British Standard BS 3998: 2010, *Tree work – Recommendations*.

4.2.2. In terms of impact upon the landscape, the proposed pruning is minor in extent, and will be largely screened in views by either the remainder of the trees' canopies, or by other trees growing within or adjacent to the site. It will have a negligible effect on the appearance of the trees when viewed from outside the site itself, and accordingly will not detract from the character or appearance of the site or conservation area.

4.2.3. Following the pruning specified, none of the proposed dwellings will lie within 2m of the extents of the canopies of trees to be retained, thereby providing adequate working space for construction, and a reasonable margin of clearance for future growth**.**

# 5. ROOT PROTECTION AREA INCURSIONS

## 5.1. Details

5.1.1. Parts of the proposed summer house will encroach within the RPA of one tree to be retained. This is shown in ***Table 3*** below.

| Tree no. | Species | Description | % of RPA |
|---|---|---|---|
| 8 | English oak | Proposed summer house | 6.5% |

***Table 3:*** **Proposed excavation or disturbance of soil within RPAs**

## 5.2. Assessment

5.2.1. The incursion by parts of the proposed summer house into the RPA of the English oak tree (no. 8) extends no closer than 7m to the trunk, and equate to no more than 6.5% of its RPA; and potential adverse impacts can be satisfactorily mitigated by the foundations being constructed using mini piles and above-ground beams, and by any excavations within these areas being undertaken manually, under the direct control and supervision of an appointed arboricultural consultant, so that any over dig into the RPA is avoided, and any roots encountered can be treated appropriately.

5.2.2. As there are no areas of proposed hard surfacing within the RPAs of any of the trees to be retained, subject to the implementation of protective measures specified at **Appendix 2** and on the TPP, there will be no damage to roots or rooting environments as a result of root severance or damage, or compaction or pollution of the soil.

5.2.3. The necessary precautions to prevent other incursions into the RPAs of retained trees and to protect them during construction can be assured by the erection of appropriate protective fencing and the installation of ground protection, as shown on the TPP at **Appendix 5**.

5.2.4. Accordingly, subject to implementation of the above measures, and taking into account the age and current physiological condition of this specimen, we consider that no significant or long-term damage to its root system or environment will occur as a result of this incursion.

# 6. CONCLUSIONS

## 6.1. Summary

6.1.1. Our assessment of the impacts on trees, as discussed above, concludes that no category 'A' or 'B' trees and no trees of high landscape or biodiversity value are to be removed. No veteran trees, nor the main arboricultural feature of the site are to be removed. The proposed felling of the trees identified for removal will therefore represent no alteration to the main arboricultural feature of the site, and would not have an adverse impact on the arboricultural character and appearance of the local landscape or the conservation area.

6.1.2. The proposed pruning is minor in extent, and accordingly will not detract from the character or appearance of the site, conservation area or local landscape.

6.1.3. The incursion into the RPA of the English oak tree to be retained is minor, and subject to implementation of the measures recommended on the TPP and set out at **Appendix 2**, we consider that no significant or long-term damage to their root systems or environments will result.

## 6.2. Compliance with national planning policy

6.2.1. As the proposals will not involve the removal or the potential deterioration of any ancient woodland, or any veteran or "aged" trees, they comply with paragraph 118 of the NPPF.

6.2.2. As the proposals will maintain the main arboricultural feature of the site, and thereby will not have an adverse impact on the arboricultural character and appearance of the local landscape or the conservation area, or on trees of significant amenity or biodiversity value, it complies with national planning policy guidance.

## 6.3. Compliance with local planning policies

6.3.1. As the proposals will not result in the removal of trees which are of significant local amenity or landscape value and will preserve trees which contribute to the character of the conservation area,they comply with Policies DP24 and DP25 of the London Borough of Camden's Local Development Framework.

## 6.4. Conclusion

6.4.1. On the basis of our assessment, we conclude that the arboricultural impact of this scheme is of negligible magnitude, as defined according to the categories set out in ***Table A1.1*** of this report; and that it complies with national planning policy guidance.

**February 2017**

# APPENDIX 1
# Methodology

## A1.1. National policy context

A1.1.1. Under Section 197 of the Town and Country Planning Act 1990, local authorities have a statutory duty to consider the protection and planting of trees when granting planning permission for proposed development. The effects of proposed development on trees are therefore a material consideration in dealing with planning applications, and this is normally reflected in local development planning policies.

A1.1.2. Paragraph 14 of the National Planning Policy Framework (NPPF), (March 2012), states that there is a presumption in favour of sustainable development: **"At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking."**

A1.1.3. At paragraph 17 the NPPF provides a set of 12 core planning principles which are to underpin plan-making and decision-taking. Three of these (bullet points 4, 5 and 7) can be applied to trees and their role in the planning system. They state that planning should:

**"(4) seek to secure … a good standard of amenity for all existing and future occupants of land and buildings**

**(5) take account of the different roles and character of different areas, …… recognise the intrinsic character and beauty of the countryside**

**(7) contribute to conserving and enhancing the natural environment"**

A1.1.4. The NPPF makes it clear that planning permission for development should be granted unless the proposal is inconsistent with the above principles or with the policies within the local development plan, unless the benefits of the proposal significantly and demonstrably outweigh its adverse effects, or unless the NPPF itself indicates that the proposal should be restricted.

A1.1.5. Trees are mentioned specifically at paragraph 118 of the NPPF, which states: “planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss.”

## A1.2. Local policy context

A1.2.1. Relevant local planning policies are contained with the London Borough of Camden’s Local Development framework.

A1.2.2. Policy DP24 states:

**“The Council will require all developments, including alterations and extensions to existing buildings, to be of the highest standard of design and will expect developments to consider f) existing natural features, such as topography and trees”**

A1.2.3. Policy DP25 states:

**“In order to maintain the character of Camden’s conservation areas, the Council will: e) preserve trees and garden spaces which contribute to the character of a conservation area and which provide a setting for Camden’s architectural heritage.”**

## A1.3. Tree survey and baseline information

A1.3.1. We surveyed the individual trees and hedges with trunk diameters of 75mm and above[6] growing within or immediately adjacent to the site; and recorded their locations, species, dimensions, ages, condition, and visual importance in accordance with BS 5837 recommendations. The baseline information collected during our site survey was recorded on site using a hand-held digital device. This information was then imported into an Excel spreadsheet and used to produce the tree survey schedule at **Appendix 3**. The numbers assigned to the trees in the tree survey schedule correspond with those shown on the appended tree locations and protection plans.

[6] BS 5837, 4.2.4 b), recommends that all trees over 75mm stem diameter should be included in a pre-planning land and tree survey..

A1.3.2. We inspected the trees from the ground only, aided by binoculars as appropriate, but did not climb them. We took no samples of wood, roots or fungi. We did not undertake a full hazard or risk assessment of the trees, and therefore can give no guarantee, either expressed or implied, of their safety or stability.

A1.3.3. We surveyed trees as groups where we considered that they had grown together to form cohesive arboricultural features, either aerodynamically (trees that provide companion shelter), visually (e.g. avenues or screens) or culturally[7]. However, where we considered that it might be necessary to differentiate between specific trees within these groups, we also surveyed these individually.

A1.3.4. We have categorised the trees in accordance with BS 5837, and details of the criteria used for this process can be found in the notes that accompany the tree survey schedule.

A1.3.5. We have applied this methodology in line with the thrust of the NPPF's presumption in favour of sustainable development, giving greater weighting to the contribution of a tree to the character and appearance of the local landscape, to amenity, or to biodiversity, where its removal might have a significant adverse impact on these factors.

### A1.4. Tree locations plan

A1.4.1. The information in the tree survey schedule has been used to produce the tree locations plan at **Appendix 4,** which is based on the topographical survey plan provided.

### A1.5. Tree constraints

A1.5.1. In line with the NPPF's presumption in favour of sustainable development, we assessed which trees should be retained in the context of a proposed development. To do this, we identified the main arboricultural feature within or immediately adjacent to the site, whose removal we considered would have an

[7] BS 5837, 4.4.2.3.

adverse impact on the character and appearance of the local landscape, on amenity or on biodiversity.

A1.5.2. Whilst BS 5837 states that trees in categories 'A', 'B' and 'C' are all a material consideration in the development process, the retention of category 'C' trees, being of low quality, low landscape value and no material conservation or other cultural value, or of only limited or short-term potential, will not normally be considered necessary where they impose a significant constraint on development.

A1.5.3. Furthermore, BS 5837 makes it clear that young trees, even those of good form and vitality, which have the potential to develop into quality specimens when mature "*need not necessarily be a significant constraint on the site's potential*"[8].

A1.5.4. Moreover, BS 5837 states that "....care should be taken to avoid misplaced tree retention; attempts to retain too many or unsuitable trees on a site can result in excessive pressure on the trees during demolition or construction work, or post-completion demands for their removal"[9].

The 'Root Protection Areas' (RPAs)[10] of the trees identified for retention were calculated in accordance with Section 4.6 of BS 5837; and were assessed taking account of factors such as the likely tolerance of a tree to root disturbance or damage, the morphology and disposition of roots as influenced by existing site conditions (including the presence of existing roads or structures), as well as soil type, topography and drainage.

A1.5.5. Based on these principles and recommendations, the tree survey and our assessment of suitability for retention informed the production of a tree constraints plan (TCP) which showed the most suitable trees for retention, and their associated below-ground and above-ground constraints.

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[8] Ibid. 4.5.10.

[9] Ibid. 5.1.1.

[10] The minimum area around a retained 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."** BS 5837, 3.7.

A1.5.6. As a design tool, the TCP showed how close to those trees selected for retention the proposed development could be located, in terms of three key criteria:

a). avoidance of unacceptable root damage;

b). avoidance of the necessity for unacceptable pruning works.

A1.5.7. The TCP was then used to inform the siting of the proposed summer house about which we were consulted during the design process. In this way it has been ensured that the existing trees have made a significant contribution to the location of this proposed structure, rather than the proposals dictating which trees are to be removed.

### A1.6. Arboricultural impact assessment and tree protection plan

A1.6.1. Once the scheme had been finalised, we assessed the arboricultural impacts of the proposed layout, by overlaying it onto our TCP, and produced the tree protection plan (TPP) presented at **Appendix 5.** This is based on the proposed site layout plan by Yeates Design LLP, drawing no. 573/P/010.

A1.6.2. The TPP identifies the trees which will be removed as a result of the scheme proposals, either because they are situated within the footprint of the proposed development, or because in our judgment they are too close to proposed structures or surfaces to enable them to be retained. These are shown by means of **red crosses** on the plan.

A1.6.3. The TPP also shows how trees to be retained will be protected from damage during construction, and the measures identified are set out and described at **Appendix 2** to this report. The implementation of, and adherence to, these measures can readily be secured by the use of appropriate planning conditions.

A1.6.4. For the trees shown to be retained, all measurements for pruning specifications, percentage estimates of RPA incursions and shading issues have been calculated using AutoCAD software.

A1.6.5. Details of the impacts identified within these categories, and our assessment of their respective significance, are analysed in Sections 3 to 5 of the main report.

A1.6.6. On the basis of these findings, we have assessed the magnitude of the overall arboricultural impact of the proposals according to the categories defined in ***Table A1.1*** below:-

| Category | Description |
|---|---|
| **High** | Total loss of or major alteration to main elements/features/characteristics of the baseline, post-development situation fundamentally different |
| **Medium** | Partial loss of or alteration to main elements/features/characteristics of the baseline, post-development situation will be partially changed |
| **Low** | Minor loss of or alteration to main elements/features/characteristics of the baseline, post-development changes will be discernible but the underlying situation will remain similar to the baseline |
| **Negligible** | Very minor loss of or alteration to main elements/features/characteristics of the baseline, post-development changes will be barely discernible, approximating to the 'no change' situation |

***Table A1.1:*** **Magnitude of impacts**[11]

[11] Determination of magnitude based on DETR (2000) *Guidance on the Methodology for Multi-Modal Studies*, as modified and extended.

# APPENDIX 2
# Protection of retained trees

## A2.1. Tree Protection Plan

A2.1.1. The TPP at **Appendix 5** shows the general and specific provisions to be taken during construction of the proposed development, to ensure that no unacceptable damage is caused to the root systems, trunks or crowns of the trees identified for retention. These measures are indicated by coloured notations in areas where construction activities are to occur either within, or in close proximity to, retained trees, as described in the relevant panels on the drawing.

## A2.2. Pre-start meeting

A2.2.1. Prior to the commencement of any site clearance or construction works the developer will convene a pre-start site meeting. This shall be attended by the developer's contract manager or site manager, the fencing contractor, the groundwork contractor(s) and the arboricultural consultant. The LPA tree officer will be invited to attend. If appropriate, the tree surgery contractor should also attend. At that meeting contact numbers will be exchanged, and the methods of tree protection shall be fully discussed, so that all aspects of their implementation and sequencing are made clear to all parties. Any clarifications or modifications to the TPP required as a result of the meeting shall be circulated to all attendees.

## A2.3. Protective fencing

A2.3.1. Construction exclusion zones (CEZs) will be formed by erecting protective fencing around the RPAs of all on-site trees to the specification recommended in BS 5837, Section 6.2, prior to the commencement of construction. This will be at least 2.1m in height, comprising welded mesh panels; every other one braced with a 45 degree strut that is pinned to the ground; and seated in concrete or plastic bases pinned to the ground by scaffold uprights sunk to a minimum depth of 600mm, as shown in **Figure 3** of that document. Individual panels will be fixed to each other with at least two clamps, one of which will be a security clamp. "TREE PROTECTION

ZONE - KEEP OUT" or similar notices will be attached with cable ties to every third panel.

A2.3.2. The recommended positions of the protective fencing are shown by **bold blue lines** on the TPP. The precise positioning of the fencing around the trees will be considered in conjunction with any other protective hoarding/fencing which may be required around the site boundary.

A2.3.3. Within the CEZs safeguarded by the protective fencing, there will be no changes in ground levels, **no soil stripping**, and no plant, equipment, or materials will be stored. Oil, bitumen, diesel, and cement will not be stored or discharged within 10m of any trees. Areas for the storage or mixing of such materials will be agreed in advance and be clearly marked. No notice boards, or power or telephone cables, will be attached to any of the trees. No fires will be lit within 10m of any part of any tree.

### A2.4. Ground protection

A2.4.1. To allow space for construction and protection from soil compaction where proposed structures are in close proximity to RPAs of trees to be retained, the ground between the protective fencing and the footprints of the proposed structures will be covered by appropriate ground boarding, in accordance with the guidelines of Section 6.2.3.3 of BS 5837. The locations where these measures will be required are marked by **pink hatching** on the TPP.

A2.4.2. For purely pedestrian traffic, scaffold boards (or similar) will be used. Scaffold boards will comply with British Standard BS 2482: 2009 *Specification for timber scaffold boards* and be at least 225mm in width and 38mm thickness; they will be butted up and attached to each other with wooden battens or metal tie straps, and laid either on an above-ground scaffold framework, or secured to the ground with steel pins above a compressible material (a 75mm deep layer of woodchips may be appropriate) laid on top of a geotextile membrane of an appropriate specification.

A2.4.3. For wheeled or tracked traffic, ground boarding will be designed by a structural engineer, to take account of the type of soil and the likely loadings. Temporary aluminium roadway (‘Trakway’ or similar), interlocking plastic tread boards

("Ground-Guards" or similar), or reinforced concrete slabs may be appropriate. These will also be laid on top of a compressible material above a geotextile membrane.

### A2.5. Foundations within RPAs

A2.5.1. Within the RPA of the English oak tree no. 8 the foundations of the proposed summer house shall be of a pile and beam type design rather than of trench-fill. The first 750mm of the holes for piles shall be dug by hand, under arboricultural supervision.

A2.5.2. If roots larger than 25mm diameter are encountered they shall be retained and protected, and the pile will be relocated. Any smaller roots shall be cut cleanly by the arboricultural consultant. If roots larger than 25mm diameter are accidentally damaged, the arboricultural consultant will assess the damage and carry out any necessary remedial works. He will report to the client the extent of the damage and any long term effect to the tree's stability or health.

A2.5.3. Exposed roots will be covered with sand or hessian sacking and be kept moist at all times; they will not be left exposed to frost, wind or direct sunlight.

A2.5.4. Foundations or excavations to depths greater than 750mm will be completed by machinery positioned and operated from outside the RPAs and canopy spreads. If there is no alternative to locating excavators or piling rigs within canopy spreads, such machinery must be of a size and working height which, in operation, can be accommodated without damaging tree trunks or branches; if there is no alternative to placing excavators or piling rigs within RPAs, the ground below first must be protected from compaction by being covered by an appropriate material such as aluminium box panel track way, steel plates, or similar.

A2.5.5. Once dug, the holes for the piles shall be lined with appropriate materials to prevent the leaching of wet concrete into the soil. For piles, precast concrete pipes or heavy-duty PVC tubing may be appropriate.

A2.5.6. If back filling is needed around piles, a sharp sand and topsoil mix will be used (builders' sand will not be used as it has a high salt content and may be toxic to trees). This will be firmed and consolidated in layers, by hand; no mechanical plant will be used.

A2.5.7. The beams will be laid above existing soil level; any hollows will be filled with sharp sand.

A2.5.8. If there is no alternative to setting foundations or ground beams into the soil inside RPAs, excavation of the first 750mm depth shall be done by hand, under direct arboricultural supervision using spades, shovels, forks or picks. All roots that are encountered will be severed cleanly by the arboricultural consultant unless he judges them to be too large to cut.

# APPENDIX 3
# Tree Survey Schedule

SJA trees
ARBORICULTURAL PLANNING CONSULTANTS

17 CROSS ROAD
TADWORTH
SURREY KT20 5ST

Tel: (01737) 813058
E-mail: sja@sjatrees.co.uk

Principal: Simon R. M. Jones Dip. Arb. (RFS), F. Arbor. A.,
Arboricultural Association Registered Consultant

# Tree Survey Schedule

# 4 Highfields Grove, London. N6

**November 2016**

# Tree Survey Schedule: Explanatory Notes

## 4 Highfields Grove, London. N6

This schedule is based on a tree inspection undertaken by Tom Wawman of SJAtrees (the trading name of Simon Jones Associates Ltd.), on Friday the 11th November 2016. Weather conditions at the time were clear, dry and bright. Deciduous trees were in partial leaf.

The information contained in this schedule covers only those trees that were examined, and reflects the condition of these specimens at the time of inspection. We did not have access to the trees from any adjacent properties; observations are thus confined to what was visible from within the site and from surrounding public areas.

The trees were inspected from the ground only and were not climbed, and no samples of wood, roots or fungi were taken. A full hazard or risk assessment of the trees was not undertaken, and therefore no guarantee, either expressed or implied, of their safety or stability can be given.

Trees are dynamic organisms and are subject to continual growth and change; therefore the dimensions and assessments presented in this schedule should not be relied upon in relation to any development of the site for more than twelve months from the survey date.

**1. Tree no.**
Given in sequential order, commencing at "1".

**2. Species.**
'Common names' are given, taken from MITCHELL, A. (1978) A Field Guide to the Trees of Britain and Northern Europe.

**3. Height.**
Estimated with the aid of a hypsometer, given in metres.

**4. Trunk diameter.**
Trunk diameter measured at approx. 1.5m above ground level; or where the trunk forks into separate stems between ground level and 1.5m, measured at the narrowest point beneath the fork. Given in millimetres.

**5. Radial crown spread.**
The linear extent of branches from the base of the trunk to the main cardinal points, rounded up to the closest half metre, unless shown otherwise. For small trees with reasonably symmetrical crowns, a single averaged figure is quoted.

**6. Crown break.**
Height above ground and direction of growth of first significant live branch.

**7. Crown clearance.**
Distance from adjacent ground level to lowest part of lowest branch, in metres.

**8. Age class.**
Young: Age less than 1/3 life expectancy
Semi-mature: 1/3 to 2/3 life expectancy
Mature: Over 2/3 life expectancy
Over-mature: Mature, and in a state of decline
Veteran: Mature, with a large trunk diameter for the species; but showing signs of ancientness, irrespective of actual age, with decay or hollowing, and a crown that has undergone some retrenchment and has a structure characteristic of the latter stages of life.
Ancient: Beyond the typical age range and with a very large trunk diameter for species; with extensive decay or hollowing; and a crown that has undergone retrenchment and has a structure characteristic of the latter stages of life.

**9. Physiology.**
Health, condition and function of the tree, in comparison to a normal specimen of its species and age.

**10. Structure.**
Structural condition of the tree – based on both the structure of its roots, trunk and major stems and branches, and on the presence of any structural defects or decay.
Very good: No significant physiological or structural defects, an upright and reasonably symmetrical structure; a particularly good example of its species.
Good: No significant physiological or structural defects, and an upright and reasonably symmetrical structure.
Moderate: No significant pathological defects, but a slightly impaired physiological structure; however, not to the extent that the tree is at immediate or early risk of collapse.
Indifferent: Significant physiological or pathological defects; but these are either remediable or do not put the tree at immediate or early risk of collapse.
Poor: Significant and irremediable physiological or pathological defects, such that there may be a risk of early or premature collapse.
Hazardous: Significant and irremediable physiological or pathological defects, with a risk of imminent collapse.

**11. Comments.**
Where appropriate comments have been made relating to:
-Health and condition
-Safety, particularly close to areas of public access
-Structure and form
-Estimated life expectancy or potential

**12. Category.**
Based on the British Standard "Trees in relation to design, demolition and construction - Recommendations", BS 5837: 2012, Table 1, adjusted to give a greater weighting to trees that contribute to the character and appearance of the local landscape, to amenity, or to biodiversity.

**Category U:** Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.
• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category 'U' trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning).
• Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline.
• Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality.

**Category A**: Trees of high quality with an estimated remaining life expectancy of at least 40 years.
(1) Trees that are particularly good examples of their species, especially if rare or unusual.
(2) Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features.
(3) Trees, groups or woodlands of significant conservation, historical, commemorative or other value.

**Category B**: Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
(1) Trees that might be included in category 'A', but are downgraded because of impaired condition (e.g. presence of significant though remediable defects including unsympathetic past management and minor storm damage) such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category 'A' designation.
(2) Trees present in numbers, usually growing as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals; or trees present in numbers but situated so as to make little visual contribution to the wider locality.
(3) Trees with material conservation or other cultural value.

**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 150mm.
(1) Unremarkable trees of very limited merit or of such impaired condition that they do not qualify in higher categories.
(2) Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value, and/or trees offering low or only temporary landscape benefits.
(3) Trees with no material limited conservation or other cultural value.

# TREE SURVEY SCHEDULE

## 4 Highfields Grove, London. N6

| No. | Species | Height | Trunk diameter | Radial crown spread | Crown break | Crown clear-ance | Age class | Physio - logy | Structure | Comments | Cate gory |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sycamore | 18m | 660mm @1m | 6m N<br>5m E<br>3.9m S<br>6.25m W | 5m N | 3.5m N<br>6.5m S<br>4.5m W | Mature | Average | Poor | Twin-stemmed from 1.5m with a tight compression fork and evidence of included bark with "elephant ears" measuring around 150mm in length; this indicates that a weak union is present at this point which will be liable to failure in the future; the stems immediately above the tight compression fork are similar in diameter at around 300mm; if stems were to fail they would currently fall onto the lawned area of the garden; previously crown lifted; visible from other residential properties in the area to N and E; view from public areas is obscured by other trees; of low quality; of moderate landscape value and of short-term potential only. | C (2) |
| 2-7 | Silver birch | 16m to 18m | 240mm<br>320mm<br>250mm<br>250mm<br>200mm<br>195mm | 4m N<br>4.5m E<br>8.25m SE<br>7.3m S<br>3.9m SW<br>4.2m W<br>from #2 | 5m NW | 2.5m<br>2.5m NE | Semi-mature | Average | Poor | Group of closely planted specimens; drawn-up; mutually supressed; also supressed by oak to SW of group; T3 has fungal fruiting bodies at base on S consistent with honey fungus; also clump of honey fungus growing 2.5m to E; area of decay at base of tree adjacent to honey fungus, probed to a depth of 100mm; exudations and dark staining present on trunk on S to height of 1m; area around decay fungus sounded with an acoustic mallet and indicated an area of dead bark on this side extending to a height of 1m; trees 4-7 all have exudations with dark staining on trunks from ground level to 1.5m; leaf colour, size and density all appear normal for the time of year with no evidence of dieback which may have been expected given the presence of honey fungus at the base; visible from residential property to NE; largely obscured in views from elsewhere by other trees; given the close proximity of these trees, it is likely the honey fungus has spread to the other trees within the group although no fruiting bodies were present at the base of any of the other trees at the time of inspection; T4 has an area of missing bark on S extending to height of 1m measuring 90mm across; of low quality, of low landscape value, and of short-term potential only. | C (123) |
| 8 | English oak | 20m | 950mm | 7.6m N<br>10m E<br>10.8m S<br>13m SW<br>8m W | 4m E | 8m N<br>3m E<br>2m SE | Mature | Average | Indifferent | Single trunk; area of decay at base of tree on W measuring 500mm x 300mm; good amounts of reaction wood around opening of decay; exposed heartwood appears sound; second small area of decay located at the base of tree on SE measuring 400x100mm; area of exposed heartwood appears sound; these areas sounded with an acoustic mallet; variations in tone denoted around the vicinity of the larger pocket of decay, however no distinct variations in tone were noted in the smaller area; crown has previously been lifted and reduced; storm damage wound on trunk at 6m on E; above average epicormic growth in crown; dead limb at 6.5m on NW measuring approx. 180mm in diameter and extending for approx. 7m; of moderate quality and landscape value; of long-term potential. | B (12) |

| No. | Species | Height | Trunk diameter | Radial crown spread | Crown break | Crown clear-ance | Age class | Physio - logy | Structure | Comments | Cate gory |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-10 | Ash | 8m | 100mm<br>135mm | 2m | 2m E | 2.5m | Young | Average | Indifferent | Single trunks; young trees with stem diameters below 150mm; of moderate quality and of long-term potential; but of low landscape value. | C (1) |
| 11-13 | Beech | 21m<br>22m<br>22m | 525mm<br>450mm<br>305mm | 7.6m N<br>7.5m E<br>8.2m SE<br>7m S<br>7m SW<br>6.4m W<br>from #11 | 3.5m NE | 3.5m | Mature | Average | Indifferent | Single trunks; group of drawn-up, mutually suppressed specimens; view from outside of the site largely obscured by other trees; of moderate quality and landscape value; of long-term potential. | B (12) |
| 14 | Sycamore | 17.5m | 470mm<br>430mm | 2m N<br>4.9m E<br>7.1m S<br>7.4m W | 5m SW | 7m | Mature | Average | Poor | Twin-stemmed from 1m with tight compression fork; evidence of included bark; exposed roots to NW; canopy has previously been lifted and thinned; view from outside of the site largely obscured by other trees; of low quality; of moderate landscape value; of medium-term potential. | C (2) |
| 15 | Sycamore | 17m | 220mm<br>225mm<br>275mm | 2.3m N<br>2.6m E<br>4.6m S<br>5.2m W | 6m S | 6m | Semi-mature | Average | Poor | Three-stemmed from base with included bark unions; SW stem previously failed with area of decay at base of tree; exposed wood at this point appears sound and unable to probe; previously crown lifted; asymmetrical crown as suppressed by adjacent specimens; of low quality, of low landscape value, but of medium-term potential. | C (123) |
| 16 | English oak | 24m | 410mm | 6m N<br>7.8m E<br>3.8m S<br>2.6m W | 6m N | 4.5m | Semi-mature | Average | Indifferent | Single trunk; view from outside of the site largely obscured by other trees; asymmetrical crown as suppressed by adjacent specimens; slightly leaning trunk; of moderate quality and landscape value; of long-term potential. | B (12) |
| 17-18 | Sycamore | 20m | 445mm<br>365mm | 4.8m N<br>2.5m E<br>6m S<br>5.2m W<br>from #17 | 6m S | 6m | Mature | Average | Indifferent | Single trunks; buttress root extends into gravel footpath to E; view from outside of the site largely obscured by other trees; of moderate quality and landscape value; of long-term potential. | B (12) |
| 19 | Silver birch | 18m | 160mm<br>380mm | 2m N<br>5m E<br>6m S<br>2.8m W | 10m NE | 3m | Semi-mature | Average | Indifferent | Slightly leaning trunk; stem to N has been removed; view from outside of the site largely obscured by other trees; twin stemmed from base; of moderate quality and of medium-term potential; but of low landscape value. | C (1) |
| 20 | Sycamore | 20m | 550mm<br>400mm<br>395mm<br>525mm | 6m N<br>5.8m E<br>7.9m S<br>3.5m W | 7m E | 7.5m | Mature | Average | Poor | Four-stemmed from base with evidence of included bark unions; previously crown lifted; visible in views from residential properties to W; of low quality; of moderate landscape value; of medium-term potential. | C (2) |

| No. | Species | Height | Trunk diameter | Radial crown spread | Crown break | Crown clear-ance | Age class | Physio - logy | Structure | Comments | Cate gory |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-22 | Silver birch | 15m 14m | #21 200mm #21 240mm #22 220mm | 2.9m N 6.2m E 4.1m S 2.1m W from #21 | 6m S | 4.5m | Semi-mature | Average | Poor | Trunks leaning SE; areas of fungal fruiting bodies on ground close to these trees consistent with honey fungus extending from 0.5m from base of tree 21 to 4m from base in W and NW direction; of low quality, of low landscape value, and of short-term potential only. | C (123) |
| 23 | Hazel | 7m | est. 150mm | 3m N 4m E 4.5m S 3.5m W | 3m W | 4m | Young | Average | Indifferent | Off-site tree; ornamental tree; of moderate quality and of medium-term potential; but of low landscape value. | C (1) |
| H1 | Laurel | Up to 3m | Up to est. 30mm | .5m | .5m | 0m | Young | Average | Indifferent | Boundary hedge; regularly maintained; of moderate quality and of medium-term potential; but of low landscape value. | C (1) |
| H2 | Leyland cypress | Up to 6m | Up to est. 60mm | 2m | 1m | 3m S | Young | Average | Indifferent | Off-site hedge; growing adjacent to H1 on neighbouring property to N; of moderate quality and of medium-term potential; but of low landscape value. | C (1) |

# Root Protection Areas (RPAs)

Root Protection Areas have been calculated in accordance with paragraph 4.6.1 of the British Standard 'Trees in relation to design, demolition and construction – Recommendations', BS 5837: 2012. This is the minimum area which should be left undisturbed around each retained tree. RPAs are portrayed initially as a circle of a fixed radius from the centre of the trunk; but where there appear to be restrictions to root growth the circle is modified to reflect more accurately the likely distribution of roots.

| ***Tree No.*** | ***Species*** | ***RPA*** | ***RPA Radius*** |
|---|---|---|---|
| 1 | Sycamore | 197.1$m^2$ | 7.92m |
| 2-7 | Silver birch | 26.1$m^2$<br>46.3$m^2$<br>28.3$m^2$<br>28.3$m^2$<br>18.1$m^2$<br>17.2$m^2$ | 2.88m<br>3.84m<br>3.0m<br>3.0m<br>2.4m<br>2.34m |
| 8 | English oak | 408.3$m^2$ | 11.4m |
| 9-10 | Ash | 7.1$m^2$<br>8.2$m^2$ | 1.5m<br>1.62m |
| 11-13 | Beech | 124.7$m^2$<br>91.6$m^2$<br>42.1$m^2$ | 6.3m<br>5.4m<br>3.66m |
| 14 | Sycamore | 183.6$m^2$ | 7.64m |
| 15 | Sycamore | 79.0$m^2$ | 5.01m |
| 16 | English oak | 76.0$m^2$ | 4.92m |
| 17-18 | Sycamore | 89.6$m^2$<br>60.3$m^2$ | 5.34m<br>4.38m |
| 19 | Silver birch | 76.9$m^2$ | 4.95m |
| 20 | Sycamore | 404.5$m^2$ | 11.35m |
| 21-22 | Silver birch | 44.2$m^2$<br>21.9$m^2$ | 3.75m<br>2.64m |
| 23 | Hazel | 10.2$m^2$ | 1.8m |
| H1 | Laurel | 7.1$m^2$ | 1.5m |
| H2 | Leyland cypress | 7.1$m^2$ | 1.5m |

# APPENDIX 4
# Tree Locations Plan

N

H2 Leyland cypress

1 Sycamore

Beech 11

12 Beech

13 Beech

20 Sycamore

23 Hazel

2
7 3
6
5 4
Silver birch

14 Sycamore

H1 Laurel

8 English oak

9 Ash

10 Ash

15 Sycamore

English oak 16

17 Sycamore

18 Sycamore

19 Silver birch

21 22 Silver birch

GARAGE FL 115.09

GARAGE FL 114.33

0 2m 4m 6m 8m 10m

METRES

1 : 100 @A1

SJA trees ARBORICULTURAL PLANNING CONSULTANTS

| | | |
|---|---|---|
| Project: | 4 Highfield Grove, London | |
| Client: | Novus Finitor UK Ltd | |
| Drawing: | TREE LOCATION PLAN | |
| Drawing no: | SJA TL 16318-01 | Revision no: |
| Based on: | Topographical Survey | |
| Drawn by: TCW | Date of issue: Nov 2016 | Scale: 1:100 @ A1 |
| Checked by: | Tel:(01737) 813058 | sja@sjatrees.co.uk |
| Existing tree canopies: | | |

FOR DESIGN GUIDANCE ONLY – NOT FOR SUBMISSION TO THE LPA!

For further information refer to the SJA Tree Survey Schedule

Do not scale from this drawing: please check all dimensions on site, and notify us of any discrepancies. SJAtrees (the trading name of Simon Jones Associates Ltd.) cannot be held responsible for inaccuracies in the topographical plan on which this drawing is based.

# APPENDIX 5
# Tree Protection Plan

## Arboricultural Impacts: Summary

(For details, see below)

| Impact | No. of Trees |
|---|---|
| Trees to be removed | 7 |
| Groups of trees or hedges to be removed | 0 |
| TPO trees to be removed | 0 |
| Trees to be pruned | 1 |
| Trees where manual excavation needed within RPAs | 1 |
| Trees where above soil surfacing needed within RPAs | 0 |
| Trees with proposed underground services within RPAs | 0 |

### Trees to be Removed

| No | Species | Category |
|---|---|---|
| 1 | Sycamore | C (2) |
| 2-7 | Silver birch | C (123) |

### Total numbers of trees to be removed

| Category | No. of trees | Category | No. of trees |
|---|---|---|---|
| A | 0 | B | 0 |
| C | 7 | U | 0 |

### Trees to be pruned

| No. | Species | Works |
|---|---|---|
| 23 | Hazel | Reduce canopy on W side to 1.8m from trunk |

Pruning is to be undertaken in accordance with the British Standard Recommendations for Tree work, BS3998: 2010.
Climbing irons or spikes are not to be used whilst pruning trees.

### Trees that require manual excavation within RPAs

| No. | Species | Type of structure |
|---|---|---|
| 8 | English oak | Summer house |

## Planting schedule

| Name | Designation | Girth / Height | Root system | Planting location | Quantity |
|---|---|---|---|---|---|
| Himalayan birch *Betula utilis jacquemontii* | Standard | 8 - 10 cm / 250cm - 300cm | Container-grown | A | 4 |
| Snake bark maple *Acer capillipes* | Standard | 8 - 10 cm / 250cm - 300cm | Container-grown | B | 1 |

Plant material shall comply with British Standard BS3936: Part 1: 1992, "Nursery Stock, Part 1. Specification for trees and shrubs".
Planting shall be undertaken in accordance with British Standard BS4043: 1989, "Transplanting root-balled trees".

N

SJA trees Foundation within RPA to be constructed using piles and above ground beam.

SJA trees Temporary ground protection suitable for pedestrian traffic only; see inset panel

SJA trees Trees to be removed

SJA trees Trees to be pruned to specification in inset panel

SJA trees Protective fencing as per BS5837; see inset panel

SJA trees Root Protection Areas

H2 Leyland cypress

1 Sycamore

Beech 11

Beech 12

13 Beech

20 Sycamore

14 Sycamore

H1 Laurel

8 English oak

15 Sycamore

English oak 16

Sycamore 17

18 Sycamore

19 Silver birch

Silver birch 2

23 Haz

9 Ash

10 Ash

21 22 Silver birch

GARAGE FL 115.09

GARAGE FL 114.33

0 2m 4m 6m 8m 10m

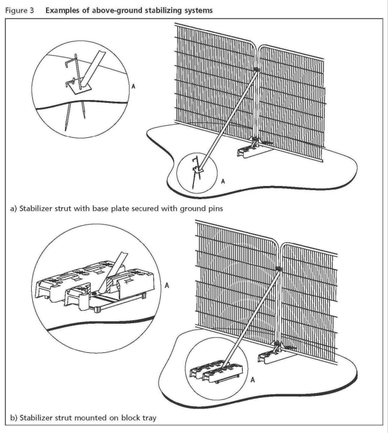
METRES

1 : 100 @A1

### Protective Fencing

To be erected prior to the commencement of all works on site, and retained in place throughout construction. To comprise 2m tall 'Heras' welded mesh panels on rubber or concrete feet. The panels shall be joined together with two anti-tamper couplers, installed so that they can only be removed from inside the fence. Distance between the couplers should be at least 1m and should be uniform throughout the fence. Panels should be supported (where possible) on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 3a). Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts shall be mounted on a block tray (Figure 3b). "TREE PROTECTION ZONE - KEEP OUT" or similar notices to be attached to every fifth panel.

Figure 3 **Examples of above-ground stabilizing systems**




TREE PROTECTIVE FENCING as shown in BS 5837: 2012, Section 6.2.2 & Figure 3.

### Ground Protection

To be installed prior to commencement of demolition or construction works, at same time as erection of protective fencing. For purely pedestrian traffic: scaffold boards or similar, of at least 35mm thickness, butted together and attached to each other with wooden battens or steel tie straps, laid either on an above ground scaffold framework, or on a compressible material (a 75mm deep layer of woodchips may be appropriate) above a biaxial geotextile grid ('geogrid' - "Tensar" or similar) and pinned to the ground with steel pins to prevent movement.
For wheeled or tracked traffic: temporary aluminium roadway ("Trakway" or similar), interlocking polyethelene tread boards ("Ground-Guards" or similar), or reinforced concrete slabs laid on an appropriate compressible layer above a biaxial geotextile grid - to be designed by a structural engineer to accommodate likely loadings.

### Arboricultural Supervision

The arboricultural consultant will directly supervise all construction works that have to be undertaken within root protection areas. These include:
1. Location of protective fencing and ground protection.
2. All excavations, for proposed foundations.

### Manual Excavation

Within root protection areas the first 750mm depth of any excavation, whether for proposed foundations, hard surfacing, or underground services shall be undertaken by hand under arboricultural supervision. The soil will be loosened with a pick or fork, and then will be cleared from roots with a compressed air soil pick. All roots will be cut cleanly with a hand saw or secateurs. The edge of the excavation closest to the trees will be covered with hessian sacking to prevent drying out, and if necessary be shuttered with an appropriate material to prevent soil collapse. Where appropriate, the soil beneath this depth may be sheet piled; and deeper excavation may be undertaken by a machine provided it works from outside the root protection areas.

SJA trees ARBORICULTURAL PLANNING CONSULTANTS

| | |
|---|---|
| Project: | 4 Highfields Grove, London, N6 |
| Client: | Novus Finitor |
| Drawing: | TREE PROTECTION PLAN |
| Drawing no: | SJA TPP 16318-01a |
| Based on: | 573/P/010 |

| | | |
|---|---|---|
| Drawn by: TCW | Date of Issue: Feb 2017 | Scale: 1: 100 @ A1 |
| Checked by: | Tel:(01737) 813058 | sja@sjatrees.co.uk |

| | | | | | |
|---|---|---|---|---|---|
| Tree nos.: | 8 | Manual excavation: | | Canopies of trees to be retained: | |
| Category 'A' RPA: | | Category 'B' RPA: | | Category 'C' RPA: | |
| Trees to be removed: | 1 | Protective fencing: | | Ground protection: | |
| Indicative pruning line: | | Replacement tree planting: | A | Location of piles and above ground beam: | |

For further information refer to the SJAtrees Tree Survey Schedule



This drawing is designed to reflect only the principles of layout and /or design insofar as these relate to the protection of trees to be retained, and should NOT be read as a definitive engineering or construction method statement. Reference should be made to the architect or structural engineer, as appropriate, over any matters of construction detail or specification, or any engineering standards or regulatory requirements relating to proposed structures, hard surfaces or underground services.