

ARBORICULTURAL IMPACT ASSESSMENT

Terms of Reference

- 1.1 This report was requested by Christine Manley of DWA Architects, Rievaulx House, 1 St Mary's Court, York, YO24 1AH.
- 1.2 The instruction was to carry out an arboricultural impact assessment to support a Planning Application regarding a proposed development at Broadwater Road, Welwyn Garden City, AL7 3AX.

Limitations

- 2.1 The content of this report is valid for a period of one year from the date shown above.
- 2.2 The report is for the sole use of the client and its reproduction or use by anyone else is forbidden unless written consent is given by the author.
- 2.3 This is an arboricultural report and as such, no reliance should be placed on comments relating to buildings or soil data.

Introduction

- 3.1 I carried out my original arboricultural survey at the Broadwater Road, Welwyn Garden City on 30th October 2014 and produced my report number 2833-2.
- 3.2 This supplementary report has been commissioned by DWA Architects to assess the arboricultural impact of the layout.
- 3.3 For ease of cross referencing, the original schedule detailing specific information on each tree is included at appendix 1. Details of the measurement conventions relating to this are contained in the original report and have not therefore been duplicated in this document.
- 4.1 To facilitate the preparation of this report, a scaled copy of the proposed layout was provided (17095/1001). My observations regarding the impact on the trees are based upon this drawing and the locations of the plotted trees within and adjacent to the site.



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Protection of Retained Trees

- 4.1 All felling and pruning operations should be undertaken by an Arboricultural Association Approved Contractor, operating in accordance with British Standard 3998 2012 – Recommendations for Tree Work and other current industry best practice guidelines. This work should ideally be completed and the protective barriers erected prior to any other site clearance or construction work commencing.
- 4.2 The trees proposed for retention will need to be rigorously protected throughout the development period to avoid them being accidentally damaged. Protective barriers should be erected prior to any work commencing.
- 4.3 The default specification for protective barriers is a vertical and horizontal scaffold framework, well braced to resist impacts with welded mesh panes securely fixed onto this framework. The vertical tubes should be spaced at a maximum interval of 3m and driven securely into the ground.
- 4.4 Where site circumstances and associated risk allow, an alternative specification should be prepared by the arboriculturalist and agreed with the Local Planning Authority. For example, 2m tall welded mesh panels on rubber or concrete feet, stabilised on the inside and joined together using a minimum of two anti-tamper couplers, installed so they can only be removed from inside the fence.
- 4.5 “Protected Trees No Entry” signs should be affixed to every fourth panel. The barriers should remain in place until completion of the construction phase and removed only on the consent of the Local Planning Authority.
- 4.6 Extreme care will also need to be exercised when removing and reinstating redundant areas of existing hard surfacing within the tree’s rooting zones. Further advice can be provided on these issues once a final layout has been agreed.
- 4.7 No other site clearance, surface removal or ground level changes should be carried out unless authorised by the Local Planning Authority. This includes storage or dumping of materials within the exclusion zones defined by the protective fencing.
- 4.8 No materials that are likely to have an adverse effect on tree health should be stored or discharged within 10m of the trunk of a retained tree, nor should fires should be lit within 20m of the trunk.

Arboricultural Impact

- 5.1 I have made an appraisal of the proposals and their potential impact on the trees. These impacts include removals, proximity issues, surface changes and protection during demolition and construction.
- 5.2 The following table details the potential conflict that the proposed operations to re-develop the site may create.

| Tree | Ret Cat | RPA Root Protection Area | Conflict | Mitigation |
|--------------|---------|-----------------------------|--|--|
| T34 Hornbeam | B2 | 5.4 | Hard surface removal within the site and RPA | Carry out work in strict accordance with Arboricultural Method Statement |
| T35 Hornbeam | B2 | 5.4 | | |
| T36 Lime | B2 | 4.8 | | |
| T37 Lime | B2 | 4.8 | | |
| T38 Lime | B2 | 4.8 | | |
| T39 Cherry | B2 | 3.4 | | |
| T42 Oak | A1 | 3.4 | | |
| T43 Oak | A1 | 3.6 | | |
| T41 Sycamore | U | 5.1 | Tree conflicts with units 15-17 | Remove the category U tree |
| T44 Oak | A1 | 3.6 | Tree conflicts with new access road | Remove tree and replace with semi-mature tree in agreement with LPA |
| T45 Poplar | U | 5.6 | Tree conflicts with unit 4 | Remove the category U tree |

- 5.3 One tree of significant quality and value will be lost as part of the development proposals. Agreement should be sought to replace T44 (Oak) with a semi-mature specimen close to the original location upon completion of the development.
- 5.4 The remaining trees on site and on adjacent land will be unaffected by the development proposals provided the attached guidance is followed. The ultimate sizes of retained trees should not cause unwanted shading or dominance of the completed development.



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Prior to commencing any arboricultural work to the trees, it is essential to liaise with the Local Planning Authority as they may be protected by a Tree Preservation Order or within a Conservation Area.

Any arboricultural work should be carried out by a competent arborist in line with BS3998 British Standards for Tree Work. Should you require details of suitably qualified contractors, the Arboricultural Association maintains a list which is available by calling 01242 522152 or via their website (www.trees.org.uk).

Should you have any questions or require any clarification, please do not hesitate to contact me.

Yours sincerely

Bruce Hatton
Dip. Arb. (RFS). F. Arbor. A. MICFor.

ARBORICULTURAL METHOD STATEMENT

Terms of Reference

- 1.1 This Arboricultural Method Statement was requested by Christine Manley of DWA Architects, Rievaulx House, 1 St Mary's Court, York, YO24 1AH.
- 1.2 It has been compiled to aid the protection of trees to be retained at at Broadwater Road, Welwyn Garden City, AL7 3AX. Implementation of the protection methods and specialist construction detailed here are integral to achieving this goal.
- 1.3 The information contained within this Arboricultural Method Statement is in line with BS5837 : 2012 'Trees in relation to construction – recommendations'.
- 1.4 This method statement is to be made available to all operatives on site during the construction process, so that they understand the scope and importance of the measures set out for tree protection.

Phasing & Monitoring of Development

- 2.1 Phasing is governed by operational constraints and therefore subject to change. The project's arboriculturalist must be notified of any changes to this schedule.
- 2.2 Phase 1 – Pre-development stage
 - 2.2.1 Tree removals/pruning of trees directly impacted by the development
 - 2.2.2 Tree removals/pruning of trees indirectly impacted by the development
 - 2.2.3 Tree protection measures implemented



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2.3 Phase 11 – Development stage

- 2.3.1 Site accessible to construction traffic
- 2.3.2 Demolition
- 2.3.3 Site compound / WC / materials
- 2.3.4 Groundworks and services
- 2.3.5 Development
- 2.3.6 Completion of development
- 2.3.7 Site inspection by arboriculturalist

2.4 Phase 111 – Post development stage

- 2.4.1 Removal of protective barriers
- 2.4.2 Hard and soft landscaping

Root Protection Areas

- 3.1 The Root Protection Areas (RPA) have been determined for each retained tree and are designed to protect the absolute minimum of tree root mass in order to ensure that the trees survive the construction process.
- 3.2 For details of the locations of trees to be retained, Root Protection Areas and Tree Protection Barriers, reference should be made to the Tree Protection Plan.
- 3.3 It is the responsibility of everyone involved in the project to respect the tree protection measures and observe the necessary precautions within and adjacent to them.

Tree Pruning

- 4.1 Care must be taken when planning site operations in proximity to retained trees to ensure that machinery, such as excavators, dumpers and cranes, can operate without coming into contact with retained trees as this may cause damage and jeopardise their retention.
- 4.2 Some pruning may be required to facilitate access but this should be kept to a minimum and must be carried out in strict accordance with the following guidelines. Under no circumstances shall construction personnel undertake any tree pruning operations.

- 4.3 Excluding planned tree removals, no other pruning work is currently proposed. However, if pruning is required, it will be carried out in accordance with BS3998 2010 Recommendations for Tree Work and in line with any work already agreed with the LPA.
- 4.4 The statutory protection afforded by the Wildlife & Countryside Act and Countryside & Rights of Way Act will be adhered to.
- 4.5 The contractor shall ideally be chosen from the Arboricultural Association's Approved Contractor list. All work shall be undertaken with the consent and approval of the site agent and arboriculturalist.

Tree Protection Barriers

- 5.1 Remedial tree work and any site clearance will be carried out prior to the erection of any tree protection barriers. However, it may be expedient to mark out the extents of any barriers to aid any site clearance and/or trimming of vegetation.
- 5.2 The Tree Protection Plan shows the alignment of Tree Protection Barriers which must be installed before any of the following take place:
 - 5.2.1 Plant and material delivery
 - 5.2.2 Demolition
 - 5.2.3 Soil stripping
 - 5.2.4 Construction work
 - 5.2.5 Utility installation
 - 5.2.6 Landscaping
- 5.3 Once erected, all barriers will be regarded as sacrosanct and will not be removed or altered without prior approval by the arboriculturalist or the LPA.
- 5.4 The barriers may require initial adjustment to facilitate removal of the current hard surface. All hard surface removal must be carried out in accordance with the relevant section of this method statement. Any alteration to the fence line must be approved by the arboriculturalist.
- 5.5 The default specification for protective barriers is a vertical and horizontal scaffold framework, well braced to resist impacts with welded mesh panes securely fixed onto this framework. The vertical tubes should be spaced at a maximum interval of 3m and driven securely into the ground.



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- 5.6 Where site circumstances and associated risk allow, an alternative specification should be prepared by the arboriculturalist and agreed with the Local Planning Authority. For example, 2m tall welded mesh panels on rubber or concrete feet, stabilised on the inside and joined together using a minimum of two anti-tamper couplers, installed so they can only be removed from inside the fence.
- 5.7 "Protected Trees No Entry" signs should be affixed to every fourth panel. The barriers should remain in place until completion of the construction phase and removed only on the consent of the Local Planning Authority.
- 5.8 Should any alternative method of barrier construction be proposed, consultation with the project arboriculturalist will be obtained to clarify the efficacy of the revised design prior to seeking consent from the LPA.
- 5.9 Trees T42, T43 and T44 will be protected by the existing fence at the front of the site. Additional protection may be required during hard surface removal.
- 5.10 Once the exclusion zone has been protected by barriers and/or ground protection, construction work can commence. All weather notices may be erected on the barriers as per the examples in Appendix C.

Restrictions with Tree Protection Areas

- 6.1 Inside the exclusion area of barriers, the following shall apply:
- 6.1.1 No mechanical excavation whatsoever
 - 6.1.2 No excavation by any other means without arboricultural site supervision
 - 6.1.3 No hand digging without a written method statement having first being approved by the arboriculturalist
 - 6.1.4 No lowering of levels for any purpose (except removal of grass sward using hand tools)
 - 6.1.5 No storage of plant or materials
 - 6.1.6 No storage or handling of any chemical including cement washings
 - 6.1.7 No vehicular access
 - 6.1.8 No fire lighting
- 6.2 A 10m separation distance shall be observed between any tree and substances injurious to tree health, including fuels, oil, bitumen, cement (including cement washings) builders sand, concrete mixing and other chemicals.
- 6.3 No fire shall be lit such that flames come within 5m of tree foliage

Soft Landscaping within Root Protection Areas (RPA)

- 7.1 Ground preparation will be carried out sensitively to ensure root damage is mitigated as much as is practicable. At no time is any heavy plant to be used within any RPA. Removal of existing vegetation will be carried out by hand, or with light machinery.
- 7.2 At no time shall a rotavator be used within any RPA to prepare the soil. Any levelling will be done by hand and with the use of hand tools.

Hard Surface Removal within Root Protection Areas (RPA)

- 8.1 Tree protection measures will remain in place until work commences and when removed all personnel working within the RPA are to be made aware of the extent and nature of the area.
- 8.2 The initial break up of the hard surface may be carried out by a mechanical excavator and the material then removed by hand.
- 8.3 Removal of the hard surface will occur in small areas working from undisturbed surface. This will enable any roots exposed to be covered with a good quality top soil to avoid desiccation and the ground to be made good as the operation progresses.
- 8.4 There will be no reduction in the level of the underlying soil surface. The soil may be levelled by the addition of up to 120mm of good quality top soil to BS3882:1984 using hand tools only to avoid disturbance.
- 8.5 Should any roots over 25mm diameter be left above the final soil level and be a hindrance to the final surface installation, their removal will only be carried out under arboricultural supervision and with the approval of the LPA.
- 8.6 If the area around retained trees is to be left following the removal of the existing hard surface before a new hard surface is laid, or soft landscaping implemented, the protective barriers must be correctly re-established immediately the hard surface removal has been completed.



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Installation of Underground Services

- 9.1 The routing of all services has been designed to avoid retained trees and their RPA's. However, if installation is required within an RPA, the arboriculturalist and LPA must be notified prior to removal of any Tree Protection Barriers.
- 9.2 Excavation with an air-spade or similar is the preferred option as it uses compressed air to remove soil from around tree roots, causing minimal damage. This operation must be undertaken by a competent operator or supervised by the arboriculturalist.

Footpath & hardstanding construction

- 10.1 Construction of the replacement hard surfaces will incorporate two main components, a geogrid and an aggregate sub-base.
- 10.2 Geogrids are a high tensile strength synthetic grid designed to support roads on soft ground. When placed on a geogrid, appropriate granular sub-base material penetrates the mesh, but is unable to pass through it, forming a positive interlock creating a reinforced platform.
- 10.3 The aggregate should be of low fines so that even when compacted, it is free draining and will allow oxygen to diffuse into the soil.
- 10.4 Construction of a surface using a geogrid and aggregate sub-base will be as follows:
- 10.4.1 Fill in any hollows with sharp sand by manual grading.
 - 10.4.2 Lay the geogrid onto the soil to cover area of the driveway
 - 10.4.3 Construct an edging if necessary with boards attached to pegs driven through the geogrid.
 - 10.4.4 Cover the geogrid with 100mm of aggregate. This should not be tipped onto the geogrid, but placed at one end and pushed onto the geogrid so that any machinery moves on the spread sub-base, not directly onto the geogrid and not on the ground either side of it.
 - 10.4.5 Compact the sub-base to ensure binding with the geogrid.
 - 10.4.6 Place the final surface. It is recommended that this consists of gravel or block pavements to allow free drainage and gaseous exchange.
- 10.5 The recommended specialist material is a cellular confinement system called Cellweb, manufactured by Geosynthetics Ltd.

| Tree No | Species | Height (m) | Clear Stem Height | DBH 1 (m) | DBH 2 (m) | DBH 3 (m) | DBH Calc (m) | Crown Spread N | Crown Spread E | Crown Spread S | Crown Spread W | Age Class | Physiological Condition | Structural Condition | Comment | Retention Category | | Life Expectancy | RPA radius (m) | RPA (m ²) |
|---------|--|------------|-------------------|-----------|-----------|-----------|--------------|----------------|----------------|----------------|----------------|--------------|-------------------------|----------------------|---|--------------------|---|-----------------|----------------|-----------------------|
| | | | | | | | | | | | | | | | | B | 2 | | | |
| 33 | Fraxinus excelsior (Ash) | 7 | 3 | 0.100 | | | 0.100 | 2 | 2 | 2 | 1 | Young | Good | Good | | B | 2 | 20 to 40 | 1.2 | 5 |
| 34 | Carpinus betulus (Hornbeam) | 9 | 2 | 0.450 | | | 0.450 | 4 | 4 | 4 | 4 | Young Mature | Good | Good | Ivy infested. Dbh estimated | B | 2 | 20 to 40 | 5.4 | 92 |
| 35 | Carpinus betulus (Hornbeam) | 9 | 2 | 0.450 | | | 0.450 | 4 | 4 | 4 | 4 | Young Mature | Good | Good | Ivy infested. Dbh estimated | B | 2 | 20 to 40 | 5.4 | 92 |
| 36 | Tilia x europaea (Lime) | 18 | 4 | 0.400 | | | 0.400 | 4 | 4 | 4 | 4 | Young Mature | Good | Good | | B | 2 | 20 to 40 | 4.8 | 72 |
| 37 | Tilia x europaea (Lime) | 18 | 4 | 0.400 | | | 0.400 | 4 | 4 | 4 | 4 | Young Mature | Good | Good | Ivy infested. Dbh estimated | B | 2 | 20 to 40 | 4.8 | 72 |
| 38 | Tilia x europaea (Lime) | 17 | 4 | 0.400 | | | 0.400 | 5 | 5 | 4 | 4 | Young Mature | Good | Good | Ivy infested. Dbh estimated | B | 2 | 20 to 40 | 4.8 | 72 |
| 39 | Prunus avium (Cherry) | 9 | 2 | 0.280 | | | 0.280 | 3 | 3 | 3 | 3 | Young Mature | Average | Good | Ivy infested. Dbh estimated | B | 2 | 10 to 20 | 3.4 | 35 |
| 40 | Acer pseudoplatanus (Sycamore) | 4 | 0 | 0.090 | 0.090 | 0.100 | 0.162 | 2 | 2 | 2 | 2 | Young | Average | Average | | U | | <10 | 1.9 | 12 |
| 41 | Acer pseudoplatanus (Sycamore) | 7 | 2 | 0.300 | 0.300 | | 0.424 | 3 | 4 | 4 | 4 | Young Mature | Average | Poor | Self set. Weak union at primary bifurcation | U | | <10 | 5.1 | 81 |
| 42 | Quercus robur 'Fastigiata' (Fastigate Oak) | 8 | 0 | 0.280 | | | 0.280 | 1 | 1 | 1 | 1 | | Good | Good | | A | 1 | 40+ | 3.4 | 35 |
| 43 | Quercus robur 'Fastigiata' (Fastigate Oak) | 8 | 0 | 0.300 | | | 0.300 | 1 | 1 | 1 | 1 | Young Mature | Good | Good | | A | 1 | 40+ | 3.6 | 41 |
| 44 | Quercus robur 'Fastigiata' (Fastigate Oak) | 7 | 0 | 0.300 | | | 0.300 | 1 | 1 | 1 | 1 | Young Mature | Good | Good | | A | 1 | 40+ | 3.6 | 41 |
| 45 | Populus nigra 'Italica' (Lombardy Poplar) | 17 | 0 | 0.470 | | | 0.470 | 1 | 2 | 1 | 1 | Young Mature | Average | Average | Group of sucker growth adjacent | U | | <10 | 5.6 | 100 |
| 47 | Quercus robur 'Fastigiata' (Fastigate Oak) | 6 | 0 | 0.250 | | | 0.250 | 1 | 1 | 1 | 1 | Young Mature | Good | Good | | A | 1 | 20 to 40 | 3.0 | 28 |

| Tree No | Species | Height (m) | Clear Stem Height | DBH 1 (m) | DBH 2 (m) | DBH 3 (m) | DBH Calc (m) | Crown Spread N | Crown Spread E | Crown Spread S | Crown Spread W | Age Class | Physiological Condition | Structural Condition | Comment | Retention Category | | Life Expectancy | RPA radius (m) | RPA (m ²) |
|---------|--|------------|-------------------|-----------|-----------|-----------|--------------|----------------|----------------|----------------|----------------|--------------|-------------------------|----------------------|---------|--------------------|---|-----------------|----------------|-----------------------|
| | | | | | | | | | | | | | | | | A | 1 | | | |
| 48 | Quercus robur 'Fastigiata' (Fastigate Oak) | 8 | 0 | 0.330 | | | 0.330 | 1 | 1 | 1 | 1 | Young Mature | Good | Good | | A | 1 | 40+ | 4.0 | 49 |