David Clarke Chartered Landscape Architect and Consultant Arboriculturist

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ARBORICULTUAL REPORT:

ARBORICULTURAL IMPACT ASSESSMENT and ARBORICULTURAL METHOD STATEMENT

In relation to a Planning Application for:

"Demolition of existing church and outbuildings and the construction of 14 family houses with road sewers and all ancillary works"

at:

Adeyfield Free Church, Leverstock Green Road, Hemel Hempstead, Hertfordshire, HP2 4HJ

Compiled by:
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February 2013

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1.0 Instruction

1.1 I have been instructed by my client - Adeyfield Free Church - to provide an appraisal of the likely impact to, and implications for, trees on, and adjacent to Adeyfield Free Church, Leverstock Green Road, Hemel Hempstead, Hertfordshire in relation to a planning application for:

"Demolition of existing church and outbuildings and the construction of 14 family houses with road sewers and all ancillary works"

2.0 Introduction

2.1 Qualifications and Experience

2.1.1 I am David Clarke, I have a Bachelor of Science Honours Degree in Landscape Management from Reading University and I am a Chartered Landscape Architect and Chartered Member of the Chartered Landscape Institute. I hold the Professional Diploma in Arboriculture (RFS) and I am a Professional Member of the Arboricultural Association. I have 20 years experience of working in both the private and public sectors in relation to arboricultural and landscape issues.

2.2 Scope of this Report

2.2.1 This Arboricultural Implication Assessment and Arboricultural Method Statement forms the Arboricultural Report for the Planning Application. They should be read in conjunction with Tree Protection Plan (TPP/AFCLGRHH/010 A) and the Arboricultural Survey (Appendix A). The Arboricultural Report is aimed at identifying and addressing those matters concerning trees in relation to the proposed planning application. It will clarify these issues:

- The principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.
- The species, size, position and condition of those trees within the area of the proposed development where trees may potentially have some significance to the proposed development. The full survey schedule is set out in Appendix A.
- The impact of the proposed development upon these trees (and vice versa) including those trees to be removed due to the proposed development.

- Any measures that are required to protect retained trees during the proposed works.

2.2.2 The trees have been assessed (see Arboricultural Survey – Appendix A) as set out in BS BS5837: 2012 `Trees in relation to design, demolition and construction. Recommendations.' A site visit to prepare the Arboricultural Survey was undertaken in January 2013 in preparation for this report.

2.2.3 Tree numbers within the text (T1-T15 and G1-G4) relate to numbers designated as part of the Arboricultural Survey unless otherwise stated. The trees are plotted on the Tree Protection Plan (TPP/AFCLGRHH/010 A) which accompanies the planning application.

2.2.4 BS 5837: 2012 `Trees in relation to design, demolition and construction. Recommendations' provides recommendations for the assessment of trees on development sites and suggests four categories into which trees should be placed for assessment purposes. These categories have been used as part of the assessment of trees within this report.

2.3 Relevant Background Information

2.3.1 It was confirmed both verbally and by e-mail with Dacorum Borough Council (15th January 2013) that the site is not protected by a Tree Preservation Order (TPO) and that the site is not located within a Conservation Area.

2.3.2 It is recommended that information on trees adjacent to the site (which may potentially be protected) be confirmed by anyone proposing to undertake any works to these trees. This should be undertaken in writing with the Local Authority before proceeding with any tree works.

2.4 Documents and Information Provided

2.4.1 All plans within this report are based upon drawings supplied by Nett Assets, Croxley Green, Hertfordshire.

2.4.2 This document has been prepared in accordance with guidance set out in British Standard BS 5837: 2012 `Trees in relation to design, demolition and construction. Recommendations' (BS 5837:2012).

3.0 Report Limitations

3.1 The report is for the sole use of the client and its reproduction or use by anyone else is prohibited unless written consent is given by the author.

3.2 The report observations are to be considered as correct at the time of inspection only. Trees are a growing, living organism, and are readily affected by many environmental factors. As such their condition and circumstances can change in a very short period of time. Therefore this report should be construed as valid for an absolute maximum of 12 months from the date of survey provided all factors remain unchanged.

3.3 This is an arboricultural report and as such no reliance should be given to comments relating to buildings, engineering, soils or other unrelated matters. The inspection of trees was undertaken from ground level and they were not climbed. No samples of wood, roots, soils or fungus were taken for analysis. Observations of the trees were confined to what was visible from within the site and surrounding public places. A full hazard risk assessment of the trees was not undertaken.

3.4 The presence of TPOs, a Conservation Area, or other designations, may affect the use of the site and the management of trees on the site. These designations can be served on the application, or adjacent, sites at any time. The landowner, or his representatives, should therefore satisfy themselves as to the presence (or absence) of these designations prior to:

- Undertaking any works to trees on, or adjacent to, the site. Where necessary written permission from the Local Authority will be required prior to undertaking tree works.
- Undertaking any of the works specified in this Arboricultural Report before planning permission is granted.

4.0 Brief Description of the Application Site and the Planning Application

4.1 The application site is consists of a church with ancillary buildings within a predominately residential area of Hemel Hempstead. It is on the junction of Leverstock Green Road and St Albans Road. There are few trees on the application site with the majority of trees being located to the site boundaries both inside and outside the site. Trees are in a mixed condition with the better quality (`B' Category) trees being located to the site frontage and side boundaries.

4.2 The application is for the demolition of the existing church and outbuildings and the construction of 14 family houses and all ancillary works. Access will be via the existing access point from Leverstock Green Road.

5.0 General principles for protection of trees during development

5.1 It is equally important to ensure the protection of trees both above and below ground. Guidance is provided in BS 5837: 2012 as to the protection of trees, before, during and after development.

5.2 The Arboricultural Impact Assessment will set out the potential impact of the proposals on trees and vice-versa. There is a need to protect trees and provide an Arboricultural Method Statement where proposals will impinge, or impact on the Root Protection Areas (RPAs) of retained trees. Root Protection Areas (RPAs) are a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. These are set out as Construction Exclusion Zones and have been calculated as part of the Arboricultural Survey.

5.3 The RPA for each tree is initially plotted as a circle centred on the base of the stem. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area will be produced. These factors include the morphology and disposition of the roots, when known to be influenced by past or existing site conditions - such as the presence of roads and structures - and site topography. Modifications to the shape of the RPA within this report reflect a soundly based arboricultural assessment of likely root distribution. The RPA may change its shape but not reduce its area whilst still providing adequate protection for the root system.

5.4 Proposals may impinge on RPAs but these should be minimal and construction techniques such as specialized foundation designs should be considered to reduce the impact of development. The proposals will relate specifically to the site conditions and each individual tree and its category within the BS 5837 grading system.

Photograph A - looking west showing trees T1-T4 outside the application side within the highway verge on Leverstock Green Road.

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ARBORICULTURAL IMPACT ASSESSMENT

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6.0 Arboricultural Impact Assessment

6.1 As stated above British Standard recommendations (BS5837: 2012 `Trees in relation to design, demolition and construction. Recommendations.') provides a formula for calculating the Root Protection Area (RPA) recommended to protect existing trees that are to be retained. The shape of the root protection area and its exact location will depend upon arboricultural considerations but the area will normally be represented on a plan as a circle. The purpose of the RPA is to prevent physical damage to tree roots and to prevent damage to the soil structure in which they live by soil compaction, changes in soil levels or prevention of gas exchange to living roots.

6.2 These RPAs are shown on Tree Protection Plan (TPP/AFCLGRHH/010 A) which also forms part of the Aboricultural Method Statement. Where incursion within the RPA of a retained tree is necessary as part of the construction process then a methodology will be in place to prevent, or reduce to an insignificant level, damage to trees.

6.3 Below (and within Appendix A) I have discussed the significance of the trees, the constraints that they are likely to pose to the proposed development (and vice-versa) and any tree works required in order to facilitate the development.

6.4 Summary of Tree Impact Assessment

6.5 There are 15 no. individual trees and 4 no. groups of trees which form the basis for this report and which could potentially be affected by the development proposals.

6.6 Of these 1 no. individual tree is recommended to be removed for arboricultural reasons irrespective of any development of the site. This tree is in decline with significant dead wood and dieback within the crown. It will be located within the car parking area of the proposed development and therefore presents a potential risk from falling branches to users and vehicles in this area. However as dead wood has wildlife benefits there may be the potential to retain this trees either as safe standing dead wood or as log piles once removed. This would need to be assessed and set out within landscape proposals for the site.

6.7 Schedule of trees recommended for removal for Arboricultural Reasons

Tree No.	Species (Common Name)	BS Category	Reason for recommended removal
T7	Hawthorn	U	Tree of poor form and condition.

6.8 Of the remaining trees 3 no. individual trees and 1 no. groups of trees will need to be removed to implement the development.

6.9 The trees to be removed are predominately C' Category trees (2 no. individual trees and 1 no. groups of trees) as set out in BS5837: 2012 Trees in relation to design, demolition and construction. Recommendations'. These are low quality trees, set within the site and with limited amenity value. The removal of these trees as part of this application is therefore deemed not to be significant and will not have a detrimental long term impact on the visual amenity of the area.

6.10 The removal of the 1 no. `B' Category Oak tree has a potential impact. However to mitigate for the loss of this tree a replacement tree could be planted within the site so as to be visible to the general public. The replacement of this tree is considered as an important element within landscape proposals so as to retain good quality trees within the site. There are sufficient areas of landscaping both within the site and on the front site boundary to accommodate replacement tree planting.

6.11 As set out above dead wood has wildlife benefits and there may be the potential to retain the logs from these trees as log piles once removed. This would need to be assessed and set out within landscape proposals for the site.

6.12 Schedule of trees removed due to the application

Tree No.	Species (Common Name)	BS Category	Reason for removal
T5	Oak	B1	Removed due to proposed development.
T13	Hawthorn	C1	Construction of 1 no. dwelling and car parking areas within RPA and canopy spread.
T15	Pine	C2	Removed due to construction of access road.
G3	2 no. Cypress	C2	Removed due to construction of proposed car port and access driveway.

6.13 The construction of the proposed dwellings is within the RPAs and canopy spreads of Oak (T1) and Horse Chestnut (T2) and the RPAs of Horse Chestnut (T3) and G2. Additionally there will be incursions within the RPAs of trees to access the site, construct car parking areas, to potentially replace or refurbish the existing access surface and to enable the dwellings to be constructed.

6.14 These potential impacts are set out and evaluated below and measures to prevent, or reduce, the effects of the proposals on these trees are set out in the Arboricultural Method Statement. The impact on retained trees from this planning application will not be significant as long as the proposals set out in this report are followed.

6.15 Schedule of trees potentially affected by the application

Tree No.	Species	BS Category	Reason for potential impact
T1	Oak	B2	• Site access on line of existing access. • Construction of a dwelling within 1% of the RPA. • Construction of a dwelling within canopy spread. • Construction activity within RPA and canopy spread. • Potential refurbishment of hard standing forming existing access.
T2	Horse Chestnut	B2	• Construction of a dwelling within 6% of the RPA. • Construction of a dwelling within canopy spread. • Construction activity within RPA and canopy spread.
T3	Horse Chestnut	B2	• Construction of a dwelling within 3% of the RPA. • Construction activity within RPA and canopy spread.
T4	Lime	B2	• Construction activity within RPA.
T8	Oak	B2	• Construction of car parking areas within RPA.
T9	Oak	B2	• Construction of car parking areas within RPA.
T12	Hawthorn	C1	• Construction of car parking areas within RPA.
T14	Holly	C1	• Construction of car parking areas within RPA.
G1	1 no. Lime and 1 no. Sycamore	B2	• Site access on line of existing access. • Potential refurbishment of hard standing forming existing access.

G2	6 no. Cypress	C2	• Construction of a dwelling within RPAs. • Construction activity within RPA.
G4	3 no. Cypress	C2	• Site access on line of existing access. • Construction of a dwelling within 1% of the RPA. • Construction activity within RPA. • Potential refurbishment of hard standing forming existing access.

6.16 Assessment of potential impacts on retained trees

6.17 Site Access

Construction vehicles and domestic vehicles (once the development is complete) will access from the existing access point from Leverstock Green Road. This is within the RPAs of retained trees as is the existing access. A methodology to protect the RPAs of these trees is set out in the Arboricultural Method Statement.

6.18 Demolition

No demolition will take place within the RPAs of retained trees. However uncontrolled removal of existing buildings could lead to soil compaction in tree rooting zones or physical damage to trees which could adversely affect their long-term health and viability. To prevent unnecessary tree loss this phase of the project will be undertaken in a controlled manner. This will include the use of Tree Protection Fencing. A methodology for this is set out in the Arboricultural Method Statement.

6.19 Removal and refurbishment of hard standing areas - existing access

Hard standing forming the existing access may be removed and refurbished within the RPAs of retained trees. A method statement has been proposed in the Arboricultural Method Statement to prevent any damage to the roots, stems or branches of these trees during these potential works.

6.20 Installation of Hard Standing Area

A new car parking area will be installed within part of the RPAs of Oaks (T8-T9), Hawthorn (T12) and Holly (T14). A method statement including the use of `no dig' methods has been proposed in the Arboricultural Method Statement to prevent any damage to the roots, stems or branches of these trees during the works.

6.21 Construction within RPAs

Construction of 2 no. of the proposed new dwellings will take place within the RPA of T1-T3 and G2 respectively. However these incursions are in all instances less than 6% of the RPA. These incursions are considered to be minor and not significant to the health or amenity of these off site trees. Additionally, as set out in BS 5837, an arboriculturist must `demonstrate that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA'. In this instance an area is shown adjacent to the RPAs as shown on Tree Protection Plan (TPP/AFCLGRHH/010 A). The use of standard trench foundations is therefore considered to be acceptable as part of this development.

6.22 Construction Activity

Uncontrolled construction activity (including demolition of existing buildings) could lead to direct or indirect damage to trees - both above and below ground. Therefore Tree Protection Fencing is proposed within the Arboricultural Method Statement to restrict and control construction activity and protect retained trees during the works.

6.23 Construction of 2 no. dwellings will take place adjacent to T1-T4 and G2 and G4 or could involve movements of people, machinery or materials around the site and the erection of scaffolding within the RPAs of these trees. Therefore Ground Protection Measures are proposed within the Arboricultural Method Statement to restrict and control construction activity and protect retained trees during the works.

6.24 Additionally the existing access points may be used by construction vehicles. The existing driveway surface will be assessed to ensure it has the capacity to carry the expected loads entering the site. The Arboricultural Method Statement will set out how the protection of roots of retained trees will be achieved during the works.

6.25 Canopy Spreads and Tree Management

Construction of Dwellings

Construction of 1 no. dwelling will be within the canopy spreads of retained trees T1-T2 and adjacent to T3. Pruning works are therefore proposed to facilitate the construction of this dwelling. These are specified within the Arboricultural Method Statement. Windows facing the trees are related to the stair access within the building. There are no habitable rooms facing the tree. Ongoing management of these trees will therefore only be undertaken to maintain a physical separation between the building and the trees and will not be required to improve light levels within the building or to create views from windows.

6.26 Construction of Development

Construction activity could take place within the canopy spreads of T1-T3. The canopies of these trees are at least 3.0 m above ground level within the application site. Tree canopies will be pruned back as discussed above. No additional tree works are required to facilitate construction activity around the site.

6.27 Construction of Car Parking Area

The construction of a car parking area will take place within the canopy spreads of Oaks (T8-T9). The canopies of these trees are above 2.0 m above the application site but may need to be raised up to 4.0 m to facilitate the construction of these spaces and their subsequent use. Pruning works to prevent damage of twigs and branches are specified within the Arboricultural Method Statement.

6.28 Shading

The retained trees are located predominately to the site boundaries or to the north of the proposed dwellings. They do not form a dense or continuous screen to the site. There will always be a significant part of the site which is not in shade. Trees will therefore not have a negative impact on the site leading to pressure to fell retained trees.

6.29 Herbicides and Pesticides

The use of herbicides and pesticides is not proposed within the RPAs of retained trees as part of this application. Should this change then chemicals will be specified which will not have an impact on retained trees.

6.30 Utility Routes

The exact location of services is not known at this stage. However it is assumed that they will connect to service runs to the existing building and/or can be located outside the RPAs of retained trees. A plan showing the layout of services and an installation methodology will be a Planning Condition as part of any Planning Approval.

6.31 Site Buildings and Storage of Materials and Plant

Poor placement of site buildings (including latrines), materials and plant can lead to direct damage to retained trees or indirect damage such as through the compaction of soils. The layout of the site has therefore been considered and planned at this early stage to reduce or prevent any potential and significant damage to retained trees. This includes the erection of Tree Protective Fencing as set out above and in the Arboricultural Method Statement.

6.32 End Use of the Proposal

The proposals will have a residential use at the end of the project.

7.0 Recommendations

7.1 Existing trees can be easily damaged directly through root severance and, inadvertently, through soil compaction which disrupts the soil structure causing asphyxiation of roots and subsequent root dysfunction. Spillage of toxic materials can also cause root death. Protection for trees selected for retention is essential to ensure they are not affected by the development.

7.2 All trees to be retained should therefore be protected as set out in the Arboricultural Method Statement.

7.3 The location and siting of all utilities should be outside of the RPAs of retained trees as enforced on site. If incursions within RPAs are unavoidable then specialised installation techniques will need to be agreed with an arboriculturist before proceeding.

7.4 An arboriculturist will be the main contact with the Local Authority Tree Officer and will notify them of the proposed schedule prior to work commencing on site.

7.5 The following issues in relation to the protection of retained trees will addressed within the Arboricultural Method Statement. Where necessary in conjunction with input from other specialists:

- Site access
- The use of Tree Protection Fencing
- Ground Protection Measures
- Demolition
- Removal of hard standing
- Construction of a `no dig' car parking areas
- Site Buildings and Storage of Materials and Plant
- Landscape proposals

Photograph B - looking towards the application site from Leverstock Green Road.

Photograph C - looking north within the application site towards Oak (T5).

Photograph D - looking east towards Oak (T8) within the children's play area.

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ARBORICULTURAL METHOD STATEMENT

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8.0 General

8.1 This document sets out the methodology for proposed works that affect trees on, and adjacent to, the site. Compliance with this (and subsequent) method statement will be a requirement of all relevant contracts associated with the development proposals. Copies of this document will be available for inspection on site. The developer will inform the local planning authority if the arboricultural consultant is replaced. This method statement should be read in conjunction with Tree Protection Plan (TPP/AFCLGRHH/010 A).

9.0 Construction Site Access

9.1 Access for demolition and construction site traffic will follow the Designated Access Route which is shown on Tree Protection Plan (TPP/AFCLGRHH/010 A). This is the existing surfaced access to the site and is within the RPAs of retained trees.

9.2 This route passes through the RPAs of Oak (T1), G1 and G4 as does the existing access. The existing access will be assessed as to its load bearing capacity for the proposed demolition, construction and 'domestic' traffic loads (once construction is complete). If required a temporary load bearing surface will be deployed to access the site during the demolition and construction phases following guidance set out in BS 5837:2012. This will protect the underlying soil structure and prevent root damage. Further details are set out in Ground Protection Measures.

9.3 The access is used by a range of vehicles and the existing surface appears to be sound. At this stage (prior to any further detailed assessment) it is therefore assumed that the driveway will be adequate to support the weight of proposed vehicles.

10.0 Tree Protective Fencing

10.1 Root Protection Areas (RPAs) are the minimum areas (in m^2) which should be left undisturbed around each retained tree as Construction Exclusion Zones. These areas have been calculated as part of the Arboricultural Survey. The protective distances where possible will be enforced by the use of robust protective fencing as outlined in BS 5837: 2012. The fencing will be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree.

10.2 In this instance it is proposed to use 2.0 m high metal mesh panels on supporting rubber blocks. The panels will be joined together using a minimum of two anti-tamper couplers to prevent access except for maintenance operations. The distance between the fence couplers will be at least 1.0 m and they will be uniform throughout the fence. Examples would include Heras fencing (See Photograph E below).

10.3 The exact composition of the soil is unknown. Clay soil, for instance, compacts very easily when wet, so it is essential that fenced areas remain undisturbed before and during demolition and construction to prevent root asphyxiation.

Photograph E - Tree Protective Fencing

10.4 Laminated site warning signs will be attached to the fencing. These signs will state:

'CONSTRUCTION EXCLUSION ZONE – NO ACCESS

No storage of materials or use of machinery should take place within this area. These fences should remain intact unless under instruction from the site foreman following consultation with an Arborist.'

10.5 The position of Tree Protection Fencing is shown on the Tree Protection Plan (TPP/AFCLGRHH/010 A). Tree Protection fencing (Phase 1) will be erected before any vehicles enter the site in connection with the demolition phase. It will be modified in association with Ground Protection Measures (Phase 2) to accommodate the construction phase including the construction of a dwellings and a car parking area.

10.6 Protective fencing will only be removed at the end of the construction phase. Fencing will be maintained to ensure that it remains rigid and complete.

11.0 Ground Protection Measures

11.1 Site Access

The site consists of an existing access within the RPAs of retained trees (T1, G1 and G4). It is assumed at this stage that, due to its existing usage and good condition, that this access can support the weight of all vehicles which are proposed to enter the site during the development. However prior to work starting on site the existing surface will be assessed as to its load bearing capacity for vehicles accessing the site during the Demolition and Construction Phases. No action will be required if it is suitable to carry the proposed weight loading. However if required a temporary load bearing `no dig' surface will be deployed following guidance set out in BS 5837:2012.

11.2 This temporary ground protection will be capable of supporting any proposed loading within the site without being distorted or causing compaction of underlying soil and therefore causing root damage.The structure of this temporary hard surface will be designed to avoid localised compaction, by evenly distributing the carried weight over the track width and wheelbase of any vehicles or machinery that are proposed to use the access. For instance for wheeled or tracked construction traffic exceeding 2 t gross weight, a proprietary system such as a three-dimensional cellular confinement system would be used. This 'no dig' load bearing surface will therefore not have any significant impact upon the trees to be retained.

11.3 Construction Activity Areas

Construction processes, including pedestrian activity and potentially scaffolding may occur within the RPAs of retained trees to construct 2 no. dwellings. These are shown on

Tree Protection Plan (TPP/AFCLGRHH/010 A). Ground Protection Measures are proposed to protect the underlying soil structure and prevent potential root damage during construction.

11.4 The protective fencing specified (2.0 m high metal mesh fencing on supporting rubber blocks) will first be erected as shown on Tree Protection Plan (TPP/AFCLGRHH/010 A) prior to construction commencing.

11.5 For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane would be suitable protection.

11.6 Relevant Ground Protection Measures will be in place before any vehicle enters the site in connection with either the Demolition or Construction phases. It will not be removed until the main construction works are complete.

12.0 Demolition

12.1 The demolition of the Church and ancillary buildings will be outside the RPAs of retained trees. However the following methodology is proposed to protect these trees during the demolition phase.

12.2 Tree Protective Fencing (Phase 1) will be set out to protect trees as shown on Tree Protection Plan - (TPP/AFCLGRHH/010 A) prior to demolition commencing. Further details and specifications for Tree Protection Fencing are set out elsewhere in this report.

12.3 Demolition of the buildings will be undertaken with great care in order not to damage retained trees. All machinery undertaken to demolish the existing building will operate from outside the RPAs of retained trees.

12.4 All demolition materials will be demolished into the existing building footprint area and removed directly from site unless to be utilised as part of the construction phase. No demolition material will be stored within protective areas of retained trees. Materials to be removed from site by the Designated Access Route as shown on Tree Protection Plan (TPP/AFCLGRHH/010 A).

12.6 Once demolition has occurred Tree Protective Fencing (Phase 2) will be implemented as shown on Tree Protection Plan (TPP/AFCLGRHH/010 A).

13.0 Removal and refurbishment of Hard Standing Areas - Existing Access

13.1 The application site consists of an existing access within the RPAs of Oak (T1) and G1 to the site frontage. This surface will be retained as the site access but may be removed and refurbished as part of the planning proposals. Hand held tools or appropriate machinery will be used (under supervision) to remove the existing hard standing materials within the RPAs of trees. Excavation will be undertaken to existing construction depths and no deeper.

13.2 As soon as the existing hard standing is removed measures must be put in place immediately to protect the underlying soil structure and protect roots from direct and indirect damage (such a desiccation). This will mean that the replacement surface will be laid immediately the existing top surface and sub-base is removed. Where possible the existing sub-base will be reused.

14.0 Construction of `No Dig' Car Parking Areas

14.1 Car parking spaces will be constructed within the RPAs of Oak (T8-T9), Hawthorn (T12) and Holly (T14). A `no dig' surface is proposed within the RPAs of these trees. This will be as set out in 'Through the Trees to Development' produced by the Arboricultural Advisory and Information Service and BS 5837:2012. A minimum distance of 0.5 m will be achieved between the trunk of the trees and the edge of the surface. This will be as set out in Figure 5 of 'Through the Trees to Development'.

14.2 Tree Protection Fencing will be set out to protect these trees as shown on Tree Protection Plan (TPP/AFCLGRHH/010 A) prior to demolition of existing buildings taking place. Pre-development tree works will be undertaken prior to the start of construction.

14.3 Protective fencing will only be removed to construct the car parking areas. At this stage it is not known when this area will be constructed. Whilst this area is being constructed individual trees will be protected with relocated fencing or (for instance) with tree

protection boxes to prevent damage to the trunks of retained trees. The exact level of protection will be confirmed within the detailed development procedures for the site and could be a planning condition as part of a planning approval.

14.4 The car park surface will be a permeable surface set on a suitable free draining sub-base. The structure of the hard surface will be designed to avoid localised compaction, by evenly distributing the carried weight over the track width and wheelbase of any vehicles that are proposed to use the driveway.

14.5 A Terram 1000 geotextile membrane and a 100mm deep Erocell 25/10 Geocell containment grid with gravel or block paviors on top (to a total depth of 165 mm) would be a suitable solution but the final design will be confirmed as part of planning conditions for any planning approval. The surface will therefore have a limited impact upon retained trees.

14.6 The surface would be constructed from outside the RPAs using the laid surfacing for support to prevent damage to RPAs during the works. The 'no dig' approach may continue outside the RPAs of retained trees or revert to a standard construction. This will, in part, depend on levels within the site. Care will be taken during the works to prevent compaction of soils and therefore to ensure that roots are not damaged

15.0 Site Organisation and Storage of Materials and Plant

15.1 During the proposed construction works attention will be paid to the protection and well being of retained trees. The site will be organised in such a manner so as to minimise the effects of the construction work on trees.

15.2 All access onto the site will be via the Designated Access Routes and all contractors parking will be outside the Construction Exclusion Zones. (see Tree Protection Plan - TPP/AFCLGRHH/010 A).

15.3 All materials and plant to be used during the construction phase will be carefully stored outside of the enforced Construction Exclusion Zones (see Tree Protection Plan - TPP/AFCLGRHH/010 A).

15.4 All site welfare buildings such as temporary latrines and other temporary structures or buildings will be outside the Construction Exclusion Zones

15.5 All toxic substances such as oils, bitumen's and residues from concrete mixing will be retained by effective catchment areas. No toxic material will be discharged within 10 m of a tree stem. No fires will be lit within 10 m of a tree stem.

16.0 Landscape Proposals including Pre-Development Tree Works

16.1 All landscaping will avoid soil re-grading and unnecessary disturbance within the RPAs of retained trees. Any ground works, such as planting of replacement trees or spreading of top soil, within the RPAs of retained trees will be undertaken using hand held tools or suitable machinery (under supervision). Appropriate machinery would include vehicles with low pressure tyres.

16.2 Pre-Development Tree Works - in relation to the construction of car parking areas.
It is proposed to crown lift Oaks (T8-T9) to 4.0 m above ground level within the application site. These works will be undertaken before the start of the construction phase to avoid any potential conflict with contractors and machinery during the work. This will ensure an adequate separation between tree canopies and the proposals during the construction of the car parking areas

16.3 Crown lifting will not result in the removal of more than 15% of the live crown height and the remaining live crown will make up at least two-thirds of the height of the tree. It will predominately involve the removal of secondary branches or branch shortening rather than removal of branches back to the stem.

16.4 Pre-Development Tree Works - in relation to the construction of dwellings.
It is proposed to selectively prune the canopies of Oak (T1) and Horse Chestnuts (T2-T3) to facilitate the construction of 1 no. dwelling. These works will be undertaken before the start of the construction phase to avoid any potential conflict with contractors and machinery during the work. This will ensure an adequate separation between tree canopies and the building to ensure that they can have a harmonious, long term relationship.

16.5 Oak (T1) generally has an upright form but with some extended lateral branches within the application site (see Photograph E). These lateral branches should be retained as part of the tree works proposals. Horse Chestnuts (T2-T3) have more compact forms with predominately secondary branches within the application site. Selective pruning is often

used in these situations as an appropriate method of providing separation between a tree canopy and a structure.

16.6 Selective pruning of these trees will predominately involve the removal of secondary branches or branch shortening rather than removal of branches back to the main stem. A clearance of at least 1.5 m will be achieved between the tree canopy and the building. This will allow for some regrowth to occur without impacting on either the building or the tree. The amount of material to be removed and the diameter(s) of the pruning cut(s) will be the minimum required for the purpose.

16.7 All works shall be undertaken by a qualified Arboriculturist to BS 3998:2010 `Tree Work - Recommendations' to ensure that the health, amenity and viability of the trees are maintained.

17.0 Conclusion

17.1 It is proposed to remove 3 no. individual trees and 1 no. group of trees as part of the implementation of the planning application. These are predominately `C' Category low quality trees as set out in BS5837: 2012 `Trees in relation to design, demolition and construction. Recommendations'. They are generally of limited amenity value within the wider landscape as they are not readily visible from outside the site. The removal of a `B' Category tree could be mitigated for by the planting of replacement trees as part of the landscape proposals for the site. The removal of these trees is not so significant such as to prevent the granting of a planning approval.

17.2 Construction works will take place within the RPAs and canopy spreads of retained trees. However the effect on retained trees will be minimal and insignificant providing that the recommendations and Arboricultural Method Statement are implemented.

17.3 Retained trees will be protected during the demolition and construction phases. This report sets out how retained trees are an important part of the development of the site and how protection and retention of trees will be achieved. The effect on trees from the proposals will be minimal given the proposed site layout and conditions and providing that the Arboricultural Method Statement is implemented.

17.4 The development is acceptable in arboricultural terms and should receive planning consent.

Appendix A
Arboricultural Survey
Adeyfield Free Church, Leverstock Green Road, Hemel Hempstead, Hertfordshire, HP2 4HJ

1.0 Introduction

1.1 I visited the site on 4th January 2013 to inspect relevant trees in relation to a proposed planning application at the above site. Relevant trees are those within the area of the proposed development (both on and adjacent to the application site) which may potentially have some significance to the proposed development. The survey includes the species, size, position and condition of these trees. A full list and description of Survey Terms is given below. Where possible trees were assessed as individual specimens, however, where trees formed distinctive groups within the landscape these were assessed and graded as groups.

1.2 This survey has been prepared following guidance set out in BS 5837: 2012 `Trees in relation to design, demolition and construction. Recommendations'. It seeks to offer guidance in relation to planning application discussions or designs for the site. As suggested by BS5837: 2012 `Trees in relation to design, demolition and construction. Recommendations' all trees with a stem diameter of less than 75 mm at 1.5 m above ground level were excluded from the survey.

2.0 Description of Survey Terms

2.1 **Tree Reference Number** is the number allocated as part of this Arboricultural Survey. This may be different from other surveys undertaken on the site and the tree may, or may not, be tagged on site.

2.2 **Height** of the tree is measured in metres to the centre of the crown or the highest point of the tree. There is a tolerance of plus or minus 1.0 m.

2.3 **Crown Spread** is taken at compass points N, E, S and W from the centre of the tree stem. This is to the nearest 0.5 m. Where tree canopies spread off-site then estimations (est) have been made. With regard to groups the average canopy spread is given. Where individuals within the group are significantly different from this these are shown on the plan and the maximum spread stated within the report. The height above ground level and direction of the `First Significant Branch (First significant branch) is given where relevant.

2.4 **Stem Diameters** are taken at 1.5 m above ground level unless otherwise stated. Where measurements of trunk diameter are not possible then estimations (est) have been made. This may be due to ivy on the trunk or where trees are not on the application site. The annotation ms refers to multi-stemmed trees.

2.5 **Root Protection Areas** (RPAs) are calculated from stem diameter measurements as set out in BS5837: 2012 `Trees in relation to design, demolition and construction. Recommendations'. RPAs are the areas (in m^2) around each retained tree which contain sufficient rooting volume to ensure the survival of the tree. The area will normally be represented on a plan as a circle or polygon. If shown as a circle the **Radius of Root Protection Area Zone** is included.

2.6 **Age Class** - A young tree (Y) is within its first $1/3^{rd}$ of life expectancy. A middle aged tree (MA) is within its second $1/3^{rd}$ of life expectancy and a mature tree (M) is within its final third of life expectancy. An Over Mature tree (OM) is beyond its average life expectancy and a Veteran (V) is usually beyond the typical age range for the species but of biological, cultural or aesthetic value.

2.7 **Physiological and Structural Condition** - Trees in a Good Physiological or Structural Condition have no visible problems or significant defects. Those in a Fair Condition have remedial symptoms or defects or where these symptoms or defects are not remedial but will not affect the **Estimate Remaining Useful Contribution** and those in a Poor Condition have defects which are not remedial and removal of the tree should be considered.

2.8 **Comments** give a description of the tree including its general form, description of any physical defects, disease or decay and other appropriate details based on the health, vitality and overall structural integrity. It also includes the environment in which the tree is growing. **Recommendations** for the management of the tree or group will be given where required.

2.9 A tree of good form has a shape that is typical of the species or has amenity in its own right. A tree with moderate form has been affected by its environment and is not typical of the species and has limited amenity value on its own right though it may have a collective amenity with adjacent trees. A tree with poor form has low quality and may also have structural defects which will affect its long term retention. **Canopy height above ground level** is given where this is applicable.

2.10 **Estimated Remaining Useful Contribution** is the estimated number of years that the tree will continue to make a safe and useful contribution to its surroundings, taking into account its current age, physiological and structural condition and its current location or environment. This assumes that there will be no changes within its immediate environment.

2.11 **Category Grading** - trees have been categorised in accordance with the cascade chart set out within BS5837: 2012 `Trees in relation to design, demolition and construction. Recommendations'.

2.12 The trees inspected as part of this report were inspected from the ground only and were not climbed. No samples of wood, roots, soils or fungus were taken for analysis. Observations of the trees were confined to what was visible from within the site and surrounding public places. A full hazard risk assessment of the trees was not undertaken.

2.13 Where access to trees is not possible and/or a certain identification is not possible then these trees are classified as `unidentified'.

Photograph E - looking west showing canopies of T1-T3 over the application site.

Tree Schedule

Tree Ref No.	Species Common Name (Latin Name)	Height (m)	Stem Diameter (mm) ***Root Protection Area (m^2)***	Radius of Root Protection Area zone (m)	Branch Spread (m) *FSB*	Age Class	Physiological/ structural Condition	Comments ● Preliminary Management Recommendations	Estimated Remaining Useful Contribution (years)	Category Grading
T1	Oak (Quercus spp)	15	690 **215.4**	8.3	N - 10.0 E - 6.5 S - 10.0 W - 9.5 *FSB - 2.0 E*	M	Good/Good	Off site tree within highway verge to Leverstock Green Road. Previously pruned - generally wounds occluded. Open crown with relatively upright crown to the north and a more spreading form to the south. This form has been influenced by the presence of adjacent tree canopies. Some surface rooting which has limited (mower) damage. Some limited dead wood in the crown. Canopy to 3.0 m over application site. Water pocket to centre of tree. ● Recommend further (climbing) inspection of water pocket to assess if there is any significant rot at this point which may affect the structural integrity of the tree.	40+	B2
T2	Horse Chestnut (Aesculus hippocastanum)	14	550 **136.9**	6.6	N - 9.5 E - 4.0 S - 7.5 W - 5.0 *FSB - 2.0 E*	MA	Good/Good	Off site tree within highway verge to Leverstock Green Road. Previously pruned including over the application site. Limited rot at prune points and some partly occluded. Some surface rooting which has limited (mower) damage. Monitor limited de-lamination to some branches. Canopy to 3.5 m over application site. Water pocket to centre of tree. ● No preliminary management recommendations recommended at time of survey.	40+	B2

T3	Horse Chestnut (Aesculus hippocastanum)	14	510 **117.7**	6.1	N - 7.5 E - 5.0 S - 5.0 W - 2.5 *FSB - 3.0 E*	MA	Good/Fair	Off site tree within highway verge to Leverstock Green Road. Wound to centre of tree at 2.0 m to south with some weeping from the wound and damaged branches at 4.0 m to north and 5.0 m to west. Branch to north at 4.0 m is associated with poorly attached secondary branch (est. 100 mm diameter). Some surface rooting which has limited (mower) damage. Canopy to 3.0 m over application site. ● Recommend further (climbing) inspection of wounds and damaged branches to assess if there is any significant rot or damage at this point which may affect the structural integrity within the tree. ● Recommend removal of poorly attached secondary branch at 4.0 m to north.	40+	B2
T4	Lime (Tilia spp)	13	530 **127.1**	6.4	N - 6.5 E - 6.0 S - 5.0 W - 4.0 *FSB - 2.0 N*	MA	Good/Fair	Off site tree within highway verge to Leverstock Green Road. Squat form with a proliferation of twiggy growth within the crown. Previously pruned with some rot at pruning points. Some limited basal growth. Canopy to 2.5 m over the site. Crossing and rubbing branches within the crown - some co-joined. ● Recommend removal of crossing and co-joined branches where these will not affect the structural integrity or shape of the tree.	40+	B2
T5	Oak (Quercus robur)	13	710 (below branch junction) **228.1**	8.5	N - 6.5 E - 8.0 est S - 6.5 W - 7.0 *FSB - 1.5 S*	M	Good/Good	Prominent tree on street frontage. Some damage in the crown. Canopy to 1.0 m over application site. ● No preliminary management recommendations recommended at time of survey.	40+	B1

T6	Leyland Cypress	4	100 est **4.5**	1.2	N - 1.5 E - 1.5 S - 1.5 W - 1.5 All est *FSB - n/a*	Y	Fair/Fair	Off site tree. Full inspection not possible. Ivy to trunk. ● No preliminary management recommendations recommended at time of survey.	10+	C1
T7	Hawthorn (Crataegus monogyna)	8	497 (1 x 120 mm, 1 x 200 mm, 1 x 250 mm and 1 x 300 mm diameter stems) **112.0**	6.0	N - 3.0 E - 3.5 S - 2.5 est W - 2.0 *FSB - n/a*	MA	Poor/Fair	Significant dead wood and dieback within the crown. ● Recommend that tree is removed and replanted unless it can be safely retained within the use of the site.	Less than 10	U
T8	Oak (Quercus spp)	15	808 (1 x 480 mm and 1 x 650 mm diameter stems) **295**	9.7	N - 10.0 E - 8.5 S - 10.0 W - 3.5 est *FSB - 2.0 S*	M	Good/Good	On very small mound within garden area. Canopy weighted to north and south. Some surface roots with limited (mower?) damage with root bark removed. Limited dead wood in crown. Previously pruned. Canopy to approximately 2.0 m over site. Rope tied around 1 no. branch at 2.5 m to north and being consumed as branch grows. Girdling branch and potential point of structural weakness. ● Recommend removal of rope around branch and assessment to see if branch can be safely retained due to current usage of the area as a children's play ground.	40+	B2
T9	Oak (Quercus spp)	12	635 (1 x 250 mm, 1 x 300 mm and 1 x 500 mm diameter stems) **182.4**	7.6	N - 9.0 E - 3.5 S - 6.0 W - 9.0 all est *FSB - n/a*	M	Good/Good	Off site tree. Full inspection not possible. Crown weighted to north and south. Previously pruned. ● No preliminary management recommendations recommended at time of survey.	40+	B2

T10	Cherry (Prunus spp)	12	472 (1 x 250 and 1 x 250 mm diameter stems) **100.1**	5.7	N - 4.0 E - 5.0 S - 4.0 W - 5.0 all est *FSB - n/a*	M	Fair/Fair	Off site tree. Full inspection not possible. Previously pruned. Some damaged and dead branches in the crown. Fungus (unidentified) to one dead branch to south within upper crown. ● No preliminary management recommendations recommended at time of survey.	20+	C2
T11	Rowan (Sorbus aucuparia)	10	339 (3 x 100 mm, 1 x 200 mm and 1 x 150 mm diameter stems) **52.0**	4.1	N - 5.5 E - 4.5 S - 3.5 W - 2.5 all est *FSB - 2.0 S*	MA	Fair/Fair	Off site tree. Full inspection not possible. Crossing and rubbing branches within the crown. Limited ivy to trunk. Some limited damage within the crown. Canopy weighted to north due to presence of adjacent trees. ● Recommend removal of crossing branches where these will not affect the structural integrity or shape of the tree.	20+	C2
T12	Hawthorn (Crataegus monogyna)	8	479 (1 x 170 mm, 1 x 280 mm and 1 x 350 est mm diameter stems) **103.8**	5.7	N - 4.0 E - 3.0 S - 3.0 W - 4.0 *FSB - n/a*	MA	Fair/Fair	Previously reduced to 3.0 m. Some limited ivy to base and ivy has recently been removed from the crown. Moderate form. ● No preliminary management recommendations recommended at time of survey.	20+	C1
T13	Hawthorn (Crataegus monogyna)	8	578 (1 x 150 mm, 1 x 160, 1 x 200 mm, 1 x 230 mm and 1 x 440 mm diameter stems) **151.2**	6.9	N - 3.0 E - 4.5 S - 3.5 W - 3.0 *FSB - n/a*	MA	Fair/Fair	Tree of moderate form. Some limited ivy to base and into crown. Previously pruned. Significant limbs (over 150 mm diameter) removed from base and crown. Rot at some pruning points. Used as part of children's play area. Crossing and rubbing branches within the crown - some co-joined. ● Recommend removal of crossing and co-joined branches where these will not affect the structural integrity or shape of the tree.	20+	C1

T14	Holly (Ilex aquifolium)	5	200 est **18.1**	2.4	N - 1.0 E - 3.0 S - 2.0 W - 1.0 *FSB - n/a*	MA	Fair/Fair	Off site tree. Full inspection not possible. Leaning on boundary fence. Previously pruned. Crown weighted to the east. Moderate form. ● No preliminary management recommendations recommended at time of survey.	10+	C1
T15	Scots Pine (Pinus sylvestris)	9	340 **52.3**	4.1	N - 3.5 E - 4.0 S - 4.0 W - 4.0 *FSB - n/a*	MA	Fair/Fair	Previously pruned. Some ivy to trunk. Moderate form. ● No preliminary management recommendations recommended at time of survey.	20+	C1

Tree Ref No.	Species	Height (m) range	Stem Diameter (mm) **Root Protection Area (m^2)** *Radius of Root Protection Area zone (m)*	Branch Spread - general (max) **(m)**	Age Class (general)	Physiological/ Structural Condition (general)	Comments (general) ● Preliminary Management Recommendations	Estimated Remaining Useful Contribution (years)	Category Grading
G1	1 no. Lime (Tilia spp) and 1 no. Sycamore (Acer pseudoplatanus)	13	370 - 430 **61.9 - 83.7** *4.4 - 5.2*	N - 5.0 E - 6.0 S - 5.0 W - 4.0 *FSB - 2.0 S*	MA	Good/Good	Off site tree within highway verge to Leverstock Green Road. Canopy to 3.0 m over existing access. Some limited basal growth. ● No preliminary management recommendations recommended at time of survey.	40+	B2
G2	6 no. Lawson Cypress (Chamaecyparis lawsoniana)	9	80 est - 300 est **2.9 - 55.4** *1.0 - 4.2*	N - 2.0 E - 3.0 S - 3.0 est W - 3.0 *FSB - n/a*	MA	Fair/Fair	Row of off site trees. Full inspection not possible. Ivy into crowns. ● No preliminary management recommendations recommended at time of survey.	20+	C2

G3	2 no. Leyland Cypress (x Cuprocyparis leylandii)	9	474 - 566 **101.7 - 145.0** 5.7 - 6.8	N - 2.0 E - 2.5 S - 2.5 W - 1.5 *FSB - n/a*	MA	Good/Fair	Group of trees of moderate form. Previously pruned and partly reduced to 3.5 m. Canopy to ground level. ● No preliminary management recommendations recommended at time of survey.	20+	C2
G4	3 no. Leyland Cypress (x Cuprocyparis leylandii)	12	220 - 600 **21.9 - 162.9** *2.6 - 7.2*	N - 2.0 E - 2.0 S - 2.0 W - 2.0 *FSB - n.a*	MA	Good/Fair	Group of trees of moderate form growing adjacent to existing access. Previously pruned and partly reduced to 3.0 m. Some ivy into crowns. ● No preliminary management recommendations recommended at time of survey.	20+	C2