

Ben Bennett  
Tree and Woodland Consultancy  
ben@bbtrees.co.uk  
www.bbtrees.co.uk

**Arboricultural Impact Assessment:  
Fir Lodge, Stakenbridge Lane, Hagley, Worcestershire, DY9 0JE**

**Prepared for:**  
Michelle Feeney  
c/o BB Partnership Ltd Chartered Architects  
Studios 33–34  
10 Hornsey Street  
London  
N7 8EL

## 1. Introduction

- 1.1 I received instruction from project architect Julian Williams of BB Partnership Ltd Chartered Architects on 16 February 2017 to prepare an arboricultural impact assessment in respect of the rebuilding of the existing dwelling and pool house at Fir Lodge, Stakenbridge Lane, Hagley, Worcestershire, DY9 0JE.
- 1.2 Prior to this, whilst under the employment of Midland Tree Surgeons Ltd, I produced a pre-development tree survey in June 2016. This survey was undertaken in an objective manner without regard to any particular development layout and has provided the arboricultural baseline information that has been built upon within this report.
- 1.3 National recommendations for the consideration of existing trees within a development context are set out within BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations*. The process of an arboricultural impact assessment is detailed within section 5.4 of the Standard and where applicable this document has been structured to accord with these recommendations.
- 1.4 Having regard to the arboricultural constraints identified during the pre-development assessment, the site has been re-assessed in relation to the proposed layout and construction operations that will occur close to retained trees. I have liaised closely with the project architects and landscape architects to fully understand the extent of redevelopment that will occur in relation to trees.
- 1.5 This document appraises the intended redevelopment and considers the impact upon existing tree cover. The redevelopment of the existing pool house is the most challenging aspect of the proposals in relation to the need to protect and safeguard important trees that stand in close proximity and accordingly, this has become a key focus within this assessment.
- 1.6 In addition to the BB Partnership Ltd Chartered Architects' drawings that accompany the planning submission, this report is to be read in conjunction with the associated documents:
  - Barry Chinn Associates Ltd Landscape Architects' drawings:
    - Contract number: 1663/16, Drawing number: 01, Tree Constraints Plan
    - Contract number: 1663/16, Drawing number: 02, Tree Retention and Protection Plan
  - Midland Tree Surgeons Ltd's Pre-Development Tree Survey (June 2016)

1.7 This document is set out as follows:

Section 1: Introduction

Section 2: Review of tree cover

Section 3: Proposed development

Section 4: The pool house

Section 5: Construction phase protection

Section 6: Conclusions

Appendix 1: Preliminary arboricultural method statement

1.8 It is understood that the site is not the subject of statutory tree protection in terms of being within a designated conservation area or there being any tree preservation orders applying to the site. The woodland areas adjacent to the site are subject to the Forestry Act 1967. However, this Act would not extend to offer protection to trees within the curtilage of the garden associated with the existing Fir Lodge.

1.9 In terms of the wider site context in relation to tree growth, referring to British Geological Survey Geological Viewer of Great Britain, the bedrock geology is that of a Wildmoor sandstone formation formed during the Triassic period. This has resulted in a well structured loam based, freely draining soil within the site. Such soil formation is not intrinsically highly susceptible to compaction, which is helpful in terms of maintaining the structure of the soil within the rooting environment of trees.

## 2. Review of tree cover

2.1 The pre-development tree survey took account of 46 arboricultural features divided into seven groupings of trees and 39 individual specimens.

2.2 In terms of the quality of surveyed trees, the retention categories awarded to individual trees were as follows: four trees awarded category A, 16 trees category B, 15 trees category C, whilst four trees were recorded as category U, meaning that they were recommended for removal soon irrespective of any redevelopment activity.

2.3 In terms of the seven groupings of trees, two were classified collectively as category B, whilst the remaining five were cumulatively afforded category C status.

2.4 The tree cover is balanced with coniferous elements, principally Scots pine, and deciduous trees dominated by the species sweet chestnut, false acacia, sycamore and beech, all of which are well suited to the local soil type.

2.5 Tree life phase ranges from semi-mature through to fully mature with the majority of the substantial trees being in their early to fully mature life phase, however still containing significant longevity. More recent tree planting has occurred close to the existing dwelling and principally consists of Himalayan white birch of semi-mature age.

- 2.6 The principal arboricultural features are the numerous mature sweet chestnut and false acacia trees, along with the better of the Scots pine. Often these trees occur within close proximity to existing buildings, in particular the current pool house. However, they form an important role in landscaping terms with regards to the transition of the well treed garden of Fir Lodge into the wider woodland beyond.

### **3. Proposed development**

- 3.1 It is intended to demolish the existing dwelling and rebuild on a slightly altered alignment. As part of the feasibility design stage, in terms of the alignment of the new dwelling, the root protection area requirements of existing trees has been taken into account and the northern section of the dwelling has been positioned to avoid the root protection areas of the trees between the dwelling and the pool house. The basement is incorporated beneath part of the main dwelling, however avoiding the full extent of the root protection areas of remaining trees.
- 3.2 As already alluded to, the existing single storey pool house is to be demolished, which includes the breaking out of the pool structure itself. The new pool house is to be reconstructed within the footprint of the existing building without any additional encroachment into the root protection areas of adjacent trees, which have long since adapted to the existing structure both above and below ground.
- 3.3 The new pool house is to be marginally taller, incorporating a first floor external terrace and a yoga studio/guest accommodation above. Whilst all the development activity will occur within the footprint of the extant building, both the demolition of the existing structure plus the construction of the new have been identified as the critical elements of the proposals in terms of the protection of important retained trees and is considered further within section 4 of this document.

### **4. The pool house**

- 4.1 The current pool house has a pitched roof with a level datum of 104.47 at the ridge. The replacement structure will incorporate first floor space accessed via external stairs constructed within the footprint of the existing plant room, giving access to a yoga studio and a flat consisting of bedroom, bathroom and living area. The floor plan area of the first floor level is less than that of the ground floor on three sides resulting in an external terrace on the northern, southern and western sides. Around the perimeter of the terrace area, the first floor level will have protective railings of around 1.2m in height.
- 4.2 To the eastern edge, the bedroom extends up to the outer walls of the pool house with a glazed elevation. The first floor structure is capped with a flat roof with a proposed height of 105.65, representing a 1.2m increase in height for the replacement building over the ridge line of the pitched roof on the current pool house.

- 4.3 As detailed on the Tree Constraints Plan, the pool house is surrounded on three sides by significant trees.

Photograph 1: The existing pool house viewed from the south. Mature sweet chestnut and false acacia in the foreground with the predominantly Scots pine plantation wrapping around the northern and eastern sides.



Photograph 2: The pool house with external terrace viewed from the western side. Note edge of pine plantation on raised ground, the pool house having originally been cut into the sloping ground levels.



Photograph 3: View along the northern edge of the existing pool house looking north west and showing trees on an embankment.



- 4.4 The pool house benefits from being nestled within mature trees, which is a feature that is highly prized by the property owners. Under current best practice guidelines, the juxtaposition between remaining trees and the structure would be considered too close. However, it is apparent that all remaining trees have adapted well to the amendment in their growth environment and historic changes in ground level which occurred many years ago. The majority of the trees in question were found to be in good condition and retain considerable longevity.
- 4.5 The close proximity of the trees and the spirit of place this helps to foster is a key design factor, in particular to the proposed first floor of the pool house whereby the external terrace and yoga area will benefit from seclusion and cool, tranquil canopy level views from both the bedroom, terrace and yoga studio. Although the close proximity of the structure to trees, especially within living accommodation, might traditionally be seen to present future conflict, given the occasional nature for the occupancy of the first floor space and the overriding architectural remit being that of a therapeutic relaxation area, the close proximity to trees is considered beneficial.
- 4.6 In a number of instances, fully mature trees stand within a number of metres of the periphery of the building.

Photograph 4: Scots pine trees 8, 9, 10 and 11 standing off the south eastern corner of the pool house with trees 10 and 11 being closest. Of these trees, only pine tree 11 has any significant branch overhang to the current roof line.



Photograph 5: Looking west towards sweet chestnuts 12, 13 and 14 with false acacia tree 15 in the far distance. Ground levels between the existing dwelling and the pool house are relatively level. The projecting element of the structure shown is the pool house plant room.



- 4.7 In arboricultural terms, the outstanding features are trees 12 to 15 to the southern side of the pool house, which collectively make a strong contribution to the setting of the site. Trees 12 to 14 inclusive feature part of their crowns on the northern side overhanging the existing swimming pool building roof. These trees were pruned back many years ago to provide clearance to the roof line and have typically produced replacement, small diameter branches of epicormic origin that have grown back into this space. Albeit they provide adequate clearance to the existing roof, further minor remedial pruning will be necessary to both safeguard the trees and provide room for the proposed pool house with appropriate clearance. Upon assessment, such pruning can be carried out in accordance with best practice and will not be to the long term detriment of the trees in either physiological or amenity terms.

Photograph 6: Showing the northern parts of the crowns of sweet chestnut trees 13 and 14 in relation to the existing pool house roof line.



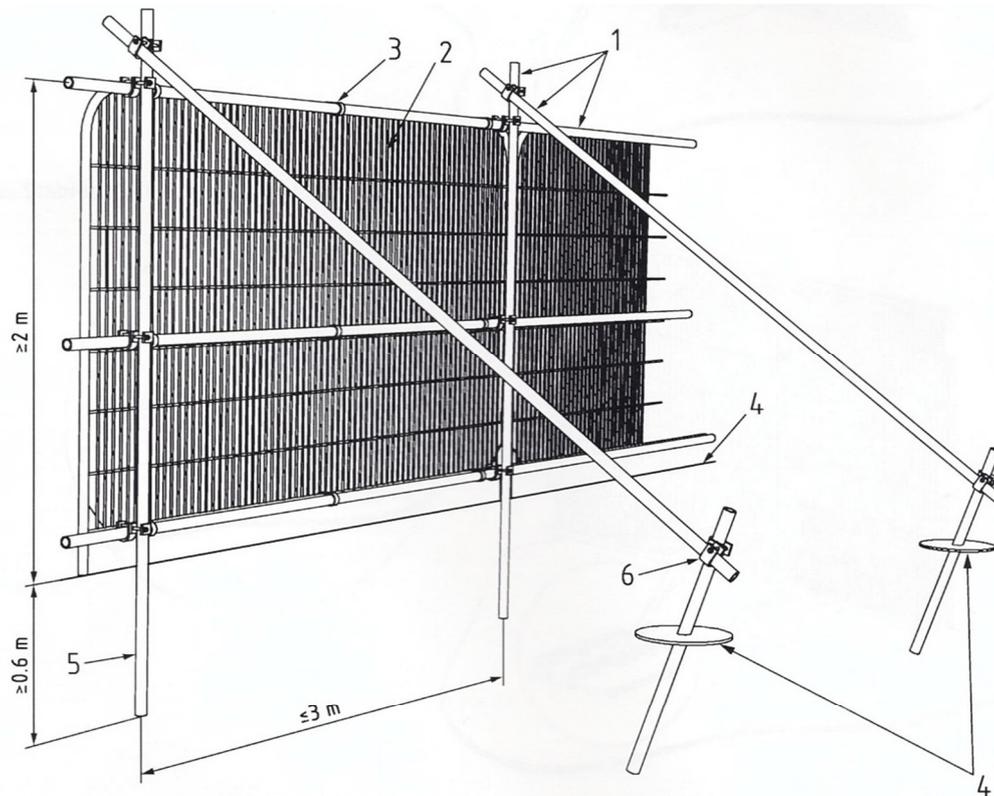
- 4.8 The demolition and construction of a replacement structure in this confined location presents a number of challenges in terms of the adequate protection of the existing trees during the construction period, which is intensified in terms of the close proximity of the works.
- 4.9 By constructing the foundations of the building and the subterranean pool retaining walls within the footprint of the existing pool house, there will not be any direct negative impact upon the remaining trees. In relation to the extra height of the replacement structure, there is adequate scope to accommodate this. Taking into account the pruning of the trees many years ago, only minor additional pruning of regrowth is required, which will not present any problem.
- 4.10 Trees during construction operations are often damaged as a result of indirect actions, often borne out of the ignorance of the physiological and structural requirements of trees. In this instance, a well co-ordinated and robust tree protection scheme is essential to ensure the successful retention of the trees, which is such an intrinsic component of the design objective.

- 4.11 Contractors working space and access routes will be significantly limited and bespoke appropriately designed and maintained tree protection measures will be necessary.
- 4.12 The tree protection measures presented in the following section of this document have taken into account the unique challenges of this particular structure, whilst the management of the remaining trees, both to facilitate construction activity and ensure remaining branches are protected from negative impact, have been detailed within the arboricultural method statement shown at Appendix 1.

## **5. Construction phase protection**

- 5.1 Prior to the commencement of all construction related work on site, it is necessary to first undertake the removal of the identified trees and remedial pruning works specified for remaining trees, allowing the subsequent erection of the robust, fit for purpose tree protection measures to protect both the physical structures of the trees plus their secured root protection areas from construction related activity.
- 5.2 Although not of any arboricultural relevance, the various shrubs growing around the periphery of the pool house will need to be removed at this stage so as to provide the necessary working area around the periphery of the pool house.
- 5.3 Prior to the commencement of any construction related activity including any demolition works, the protection measures detailed within the associated Tree Protection Plan must be fully implemented.
- 5.4 Where possible and where space allows, the default protection barrier erected to the alignment shown on the Tree Protection Plan is to accord with Figure 2 of BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations*.

Extract from BS5837: 2012 *Trees in relation to design, demolition and construction – Recommendations*, Figure 2 Default specification of protective barrier

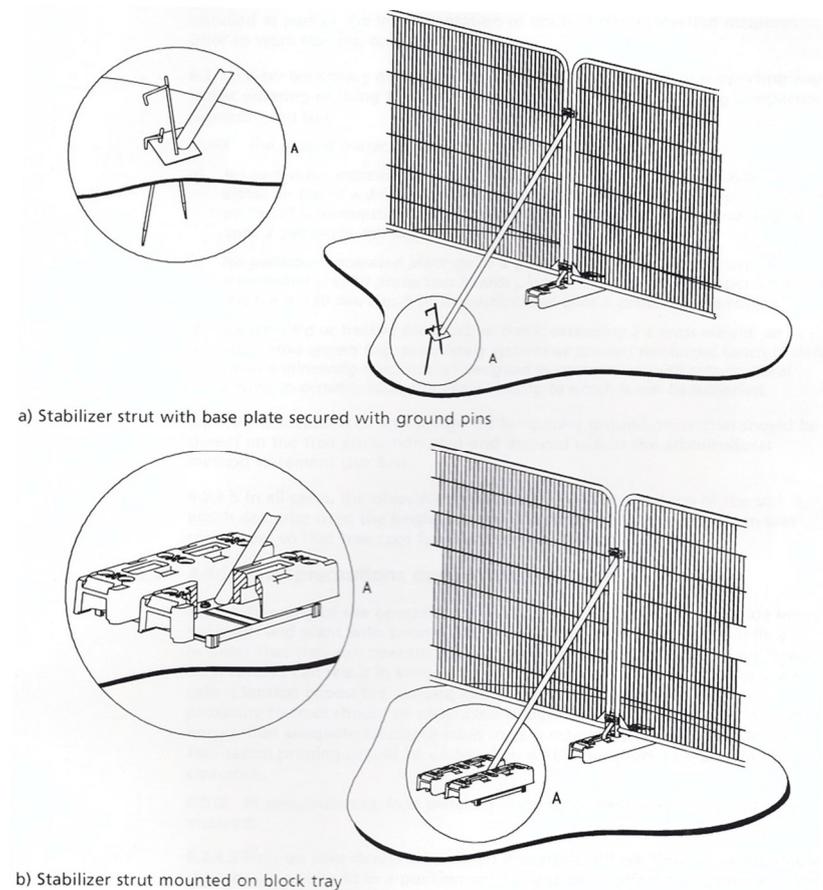


Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

5.5 However, given the changes in ground level and/or the need for construction access within identified sections of root protection areas, in places the tree protection barrier will be a combination of Figure 2 and the slightly more flexible installation based upon Heras weldmesh panels as detailed within Figure 3 a and b

Extract from BS5837: 2012 *Trees in relation to design, demolition and construction – Recommendations*, Figure 3 Examples of above-ground stabilizing systems



- 5.6 Where practical, preference is to be given to vertical scaffold poles to provide rigidity. However, where changes in ground level or existing embankments prohibit this, other forms of anchorage are appropriate, however suitable reinforcing with cross bracing is essential to ensure that the barriers remain fit for purpose and not subject to premature dismantling or easy alteration during the works.
- 5.7 Heavy duty ground protection measures will be required for plant and equipment trafficking routes. Given the nature of the works, a proprietary system such as interlocking aluminium ground boards will be necessary to provide adequate resilience against ground compaction.
- 5.8 The principle of this temporary roadway will be that any grass or soft vegetation within the route will first be removed (with minimal excavation) after which low lying areas will be raised using gravel or non-chemically washed sharp sand; the remaining surface being covered by a permeable geotextile ahead of a light dressing of partially decomposed woodchip (to a maximum depth of 100mm) with the protection boards being laid on top. The physical tree protection barriers are to be constructed immediately alongside the ground protection boards so that there is no exposed unprotected ground.

- 5.9 In relation to the trunks of trees 10, 11, 12, 13, 14, 15 and 16, physical protection to the lower trunk structure is to be ensured by the construction of bespoke wooden board protection hoarding, effectively creating secure boxes around the trunks to avoid impact damage, with the remainder of their root protection areas receiving ground protection measures.
- 5.10 The protective hoarding is to be constructed from external grade, minimum 12mm, plywood securely battened and screwed together and supported upon pressure treated square sawn stakes of a minimum of 80mm diameter, with additional rigidity being provided by external diagonal bracing back to remaining tree protection barriers or ground where this will not cause any impediment to working access or trip hazards. At no point will any hoarding be fixed to the tree trunks. As a minimum requirement, there will be at least 300mm clear space around the outside of the tree trunk to the nearest point of the hoarding. However, such clearance also needs to take account of basal trunk flare and root buttresses, which must be adequately protected. The minimum height of the protective hoarding is to be 1.8m above existing ground levels.
- 5.11 At around 5m linear intervals, waterproof signs are to be fixed to the hoarding or protective barriers with wording facing the side of construction activity stating: Construction Exclusion Zone – Keep Out.
- 5.12 The responsibility for monitoring the protection measures and maintaining them in an appropriate fit for purpose condition throughout the full course of development must be clearly assigned to site management personnel.
- 5.13 No fires should be lit within 10m of the outside of any tree protection measures.
- 5.14 If appropriate dampening down measures should be employed during the demolition of the pool house to avoid excessive dust affecting the trees, particularly pertinent if the demolition is undertaken during the active growth season.
- 5.15 When working beyond the tree protection areas, careful consideration must be given to activities that could indirectly affect the protected soil beneath or beyond. In particular, this includes the spillage of phytotoxic fluids including chemicals such as oils, fuels and alkaline leachate and non-cured concrete or mortar slurry.
- 5.16 The location of any temporary welfare buildings or facilities are to avoid the tree protection areas and there must be no temporary service connections encroaching or discharging into the protected soil zones.

## 6. Conclusions

- 6.1 The garden surrounding of Fir Lodge is well treed, which as the name suggests is an intrinsic characteristic of the property that is essential to safeguard and maintain.
- 6.2 In relation to the replacement dwelling, it is only necessary to remove the semi-mature component trees within group G27 (category C) and declining sweet chestnut tree 39, which was assessed as category U meaning its removal in the near future is inevitable irrespective of any redevelopment proposals. The remaining trees may all be adequately protected using standard best practice methodology with only pine tree 45, which grows within existing hardstanding, requiring bespoke tree protection measures to protect its lower trunk. The replacement main dwelling design respects the key arboricultural features, which are all appropriately incorporated into the new design.
- 6.3 Due to the limited working area during demolition and construction, the phasing of construction operations will need to be carefully programmed and managed with an emphasis placed upon the monitoring and maintenance of tree protection measures. However, it has been demonstrated that the house may be reconstructed without detriment of any higher quality trees. The replacement landscaping scheme is considered betterment in relation to the small number of trees to be removed.
- 6.4 With regards to the pool house, there has been significant consideration towards the retention of all worthwhile trees and it is not proposed to remove any trees as a result of the redevelopment of this structure. The close juxtaposition of the structure at first floor level in relation to the crowns of remaining trees is, in this instance, considered acceptable given the proposed use of the space and the well informed understanding of the clients of the need for careful and sensitive ongoing maintenance of the flat roof and glazed areas.
- 6.5 The initial remedial tree pruning identified can all be undertaken in accordance with best practice and will detract from the trees concerned. Subject to careful implementation, the proposals are not considered to be to the detriment of the natural longevity of the trees, especially given their existing close proximity to the current pool house, which remains in use.
- 6.6 A suitably robust tree protection scheme has been specified that, in addition to the acknowledgement of arboricultural constraints during an early stage of the design feasibility, has resulted in a proposal that is acceptable on arboricultural grounds.
- 6.7 Sufficient tree protection information has been detailed to allow for the application of a suitably worded condition attached to future planning consent to ensure compliance with the necessary tree protection measures.

March 2017  
Michelle Feeney  
Fir Lodge, Stakenbridge Lane, Hagley

Ben Bennett  
Tree and Woodland Consultancy

Signed:

A handwritten signature in black ink, appearing to read 'Ben Bennett', written in a cursive style.

**Ben Bennett BSc (Hons) For, MArbor A**

## Appendix 1: Arboricultural method statement

A1.1.1 The following trees have been identified as requiring either access facilitation pruning or removal ahead of the commencement of any construction activity:

Tree reference number	Species	Works required
8	Scots pine	Remove deadwood from lower crown. Shorten pendulous growth over drive to provide 4.5m clearance, cutting back to point of strong side growth.
9	Scots pine	Remove deadwood from trunk and crown.
10	Scots pine	Target prune lowest branch on drive side attached to trunk at around 4.5m above ground level and 70mm in diameter at collar. Remove deadwood from crown.
11	Scots pine	Shorten lowest branch over pool house roof, shortening it in length by around 2.5m and cutting to point of strong remaining side growth. Post-pruning, there is to be a minimum of 3.5m clearance off existing roof line.
12	Sweet chestnut	Remove epicormic growth from lower trunk to give clean trunk height of around 4.2m. Truncated primary branch extending towards drive that has previously been reduced is to have horizontal and drooping growth removed to give working headspace of at least 4m on lamp column side. From remainder of crown, remove dead and defective branches, selectively shortening branch in centre of crown that has recently shed secondary branch on drive side. At around 4.5m on pool house side, prune back two epicormic branches not exceeding 70mm in diameter at point of swelled branch collar. Shorten remaining epicormic growth on pool side so that post-pruning there is a crown clearance over the pool house roof of around 8m.

Tree reference number	Species	Works required
13	Sweet chestnut	Remove epicormic growth from main trunk/primary branches to a height of 8m above ground level where less than 50mm in diameter. Remove dead and defective branches from crown of tree. For lowest branch extending over pool house roof at a height of around 7m, shorten in length, removing outermost circa 3.5m, cutting back to points of side growth resulting in pruning wounds no greater than two thirds of the diameter of the remaining branch. For the section of crown overhanging existing vehicular hardstanding off the corner of the house (nearest tree 43), selectively shorten pendulous growth so that post-pruning there is at least 4.5m clearance. Lowest primary branch extending towards the corner of group G27 is to have outer growth shortened, removing around 2–3m of outer branches so as to allow machinery access beneath.
14	Sweet chestnut	Branch extending over pool house roof is to be pruned to the outer point of the horizontal section of branch radiating out at around 1.3m from point of branch failure many years ago. This will result in a somewhat truncated pruning wound of around 150mm in diameter, which will produce new adventitious branches that will require cyclical pruning. Remaining secondary growth extending towards the pool house side is to be pruned back to give around 2.5m clearance from building line.
15	False acacia	As much dead and defective material as is practicable should be removed from the crown. Tree should be crown lifted on the existing dwelling side (nearest group G27) to provide 3m clearance beneath.

Tree reference number	Species	Works required
16	Beech	Moderately crown lift, removing branches less than 35mm in diameter, which should be carefully pruned back to their branch collar and then selectively shorten remaining branches with secateurs only to give between 2m and 2.4m clearance beneath the remaining crown.
G27	Himalayan white birch	Remove all component trees.
39	Sweet chestnut	Remove.
43	Himalayan white birch	Crown lift to give 3m clearance around entire circumference (target pruning branches less than 50mm in diameter only), otherwise shortening secondary growth. Remove chafing branches. Prune back outer growth to give 1m clearance to corner of building to be demolished.

- A1.1.2 As a general principle and whenever applicable, the tree removal and access facilitation pruning should be carried out in accordance with the requirements of BS3998:2010 *Tree work – Recommendations* and should be carried out by a suitably experienced and qualified contractor, preferably an Approved Contractor to the Arboricultural Association.
- A1.1.3 In terms of the timing for undertaking the identified tree works, where possible this is to be scheduled to avoid the period of active bird nesting extending from approximately the beginning of March until the end of July, albeit that basic pre-commencement checks should be undertaken to confirm that no active bird nesting activity is under way. Should it be necessary to undertake an element of the works during the predicted bird nesting period, a more detailed assessment is necessary to ensure the works do not conflict with nesting birds, including nests under construction, which are protected by law.

### **Demolition and excavation works**

- A1.1.4 Plant and machinery only to run along designated routes with appropriate ground protection being in place and maintained throughout. Excavators are to work in conjunction with a designated banksman with all concerned operatives having been prior briefed as to the importance of avoiding physical impact damage to remaining lower branches. Where necessary, height limiting 'goal-posts' are to be installed to protect lower branches.
- A1.1.5 Excavated soil and demolition spoil is to be transported from the point of excavation to an approved storage area away from the root protection area of remaining trees.

### **New swimming pool basin**

- A1.1.6 Engineers' proposed design in terms of the basin retaining side walls is to receive arboricultural review ahead of finalisation.
- A1.1.7 Where utilising cast in situ concrete structures, provision must be made for the incorporation of an impermeable membrane/liner to stop harmful alkaline leachates from polluting soil within protected areas.

### **Further advice**

- A1.1.8 Should at any stage of the proposals it appear that to proceed with the approved development would result in conflict with remaining trees, further arboricultural advice must be sought before proceeding with this element of the works.
- A1.1.9 As a minimum, the trees will be protected by virtue of planning conditions and all contractors involved in operations should be made aware that potential damage to remaining trees or the removal of unauthorised arboricultural features may result in enforcement action.
- A1.1.10 Further arboricultural advice can be sought by contacting Ben Bennett.