ARBORICULTURAL IMPACT ASSESSMENT
ON AT GREENFIELDS PRIMARY SCHOOL, KETTERING

Prepared for MLM Environmental
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Arboricultural Impact Assessment for Land Adjacent to Greenfields Primary School, Kettering
Including Tree Survey Data, and a Tree Constraints Plan, all as Prescribed in BS5837:2012

Contents

1  Terms of Reference
2  Site Description
3  Tree Survey Details
4  Tree Constraints Plan
5  Arboricultural Impact Assessment
6  Tree Management and Replacement Planting
7  Further Arboricultural Input into the Design Process, Construction and Aftercare
8  Permissions and Constraints
9  Conclusions

Appendices

Appendix 1  Tree Survey Schedule
Appendix 2  Notes on Column Headings in Appendix 1
Appendix 3  Tree Constraints Plan
Appendix 4  Tree Protection Plan
Appendix 5  Arboricultural Method Statement
Appendix 6  Timetable for Implementation of Tree Protection Works
1. Terms of Reference

1.1 The aim of this assessment is to survey trees that may be affected by the construction of extensions and improvements to Greenfields Primary School, Kettering.

1.2 The assessment addresses the likely impact of the proposed development on surrounding trees and provides recommendations for the protection of retained trees during construction work based on BS 5837:2012 “Trees in relation to design demolition and construction-Recommendations”.

1.3 A topographical plan of the site was provided by the client in AutoCAD. All tree positions were marked on site. The plan forms the basis of the Tree Constraints Plan (TCP, Appendix 3) and Tree Protection Plan (TPP, Appendix 4).

1.4 The site is not currently within a Kettering Borough Council Conservation Area. No checks have been made with the council as to whether any of the trees are protected by Tree Preservation Orders.

2. Site Description

2.1 The site is a Primary School. The school consists of single-storey buildings across the site with a number of trees and tree groups around the site. The site entrance is at the south-eastern corner of the site, with a car park (Fig 1) surrounded by hedgerows and a number of amenity trees, including Birch, Ash, and Field Maple. There is also a small Blue Atlas Cedar adjacent to the car park. In the south-western corner of the site, separating the car park from neighbouring buildings is an Oak and a group of three Lawson Cypress (Fig 2).

2.2 Mature trees present on site include a row of three Cherry immediately adjacent to the school buildings (Fig 3) and a row Poplar on the western boundary (Fig 4).
2.3 There are numerous younger trees on site such as a Silver Birch and Field Maple in a courtyard area (Fig 5) and Birch and a small wildlife area on the northeastern corner of the site (Fig 6). In the northwestern corner of the site there is also a newly planted tree area.

3. Tree Survey Details

3.1 Appendix 1, the Tree Survey Schedule gives the survey findings in tabular form. The schedule contains all the information specified in section 4.4.2.5 of the British Standard. Appendix 2 gives a full explanation of the survey headings.

3.2 The trees were surveyed on 4\textsuperscript{th} January 2013; they were not climbed, but surveyed from ground level.

3.3 The details recorded during the tree survey have been collected independently of any development proposals, and the categorisation of the quality and amenity value of the trees is made purely on arboricultural grounds.

3.4 No assessment of the soil has taken place as part of this report. The new British Standard states that a soil assessment should be carried out by a competent person to establish the structure, clay content and potential for volume change of the soil. A survey of this nature is considered outside the scope of this Arboricultural Assessment. For guidance on soil structure in relation to construction advice should be sought from a Structural Engineer. Guidance on foundation depth in relation to building and trees can be found in NHBC Chapter 4.2.
4.0 Assessment of Tree Constraints

4.1 To facilitate the proper assessment of tree constraints a Tree Constraints Plan (TCP) has been prepared and forms Appendix 3 the plan has been produced as a basis for the assessment of the constraints imposed by existing trees on the proposed design.

4.2 Appendix 3 shows the position of trees marked by a coloured dot matching the retention category status and a reference number (as listed in Appendix 1). Heights (Ht) are marked in metres for each tree, together with the predicted ultimate heights (U/Hgt).

4.3 The plan deals with constraints that the trees may place on the development in two areas as follows:

4.4 • Below ground Constraints

The Root Protection Areas (RPA) for the trees are shown as a coloured circle to match the retention category colour. The RPA will be used to help inform the closest positions of any future buildings. The RPA will be protected during any development work with temporary barriers as prescribed by the British Standard.

4.5 • Above Ground Constraints

The branch spreads were measured at the four cardinal compass points, with a shape drawn around these points to indicate approximate branch spread, represented by green broken lines on the plan. The ultimate crown spread, based on personal experience, has been shown with an orange dashed line.

4.6 A shade pattern has been shown for each tree forming an arc from north west to due east. This gives an indication of the patterns of shadows created by the trees around mid day in the summer. This is as recommended in BS5837:2012 (Section 5.2.2) but actual shade patterns throughout the year will vary widely. If shading is likely to be a serious constraint a more detailed analysis of shade pattern using proprietary software may be deemed necessary.

5. Arboricultural Impact Assessment

5.1 Eighteen individual trees (T1-T18) and seven tree groups (G1-G7) have been included within this report. All trees are within the boundaries of the site.

5.2 Eight individual trees (T1, T10-12, T14, T15, T17, T18) and one tree group (G3) have been included in category B. This is because these trees are in good condition and have an impact on the local landscape.
5.3 The remaining 10 individual trees (T2-T9, T13, T16) and six tree groups (G1, G2, G4-7) have been placed in category C. These trees are generally small and do not play a significant role in the local landscape. C category trees are of such a quality that the Local Authority may consider it acceptable for them to be removed for development purposes, if required.

5.4 All retained trees, regardless of their category, will be given protection according to BS5837:2012.

5.5 The main elements of the development have been labelled on the TCP. In order to fully assess tree constraints for each aspect of the development, they are considered separately below:

<table>
<thead>
<tr>
<th>Element</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Build 1</td>
<td>This extension is to the north of the school buildings. There are no tree constraints relating to this section of the works.</td>
</tr>
<tr>
<td>New Build 2</td>
<td>This extension is to the west of the school buildings and extends into the existing surfaced play area. There are no tree constraints relating to this section of the works.</td>
</tr>
<tr>
<td>New Build 3</td>
<td>This building is to be built to the south of the existing school buildings, and will be linked with a passageway.</td>
</tr>
<tr>
<td></td>
<td>This new building and the passageway will be within the RPA of the three B category Cherry (T10-T12). It would also be very close to the crown of these trees. These trees are nearing the end of their safe life expectancy, and they will be removed for development purposes and replaced as set out in section 6 below.</td>
</tr>
<tr>
<td></td>
<td>There is also a tightly clipped Leyland Cypress hedgerow, and six of the trees within the group G5 that will require removal for development purposes and will be replaced as set out in section 6.</td>
</tr>
<tr>
<td>External Works 1</td>
<td>These external works refer to the extension of the existing playground.</td>
</tr>
<tr>
<td></td>
<td>As can be seen from the TCP, this extension will involve the removal of two C category trees (T8, T9) which will be replaced as set out below. Due to the necessary regrading works to the slope around the surfaced area, it will also be necessary to remove the three C category Silver Birch (T5-T7) to the north of the existing playground.</td>
</tr>
<tr>
<td>External Works 2</td>
<td>These works include the restoration of the tarmac play area once the new extension (New Build 2) has been completed. This work does not have any tree constraints.</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>External Works 3</td>
<td>These works provide an extension to the existing hardstanding play area to the west of the site. There are no tree constraints to this work.</td>
</tr>
<tr>
<td>External Works 4</td>
<td>These works provide a new tarmac play area adjacent to two B category Silver Birch (T17, T18). The new surface will be within the RPA of the B category T17 which will be removed for development purposes, and replaced as set out in section 6 below. The tarmac area is within the crown spread of the Birch T18. The tree has a crown clearance of 2.0m. This should be sufficient, but care must be taken when carrying out construction works to avoid damaging the crown of this tree.</td>
</tr>
<tr>
<td>Extended Car Park</td>
<td>It is proposed to increase the size of the main car park. In the south-eastern corner of the site the car park does encroach slightly into the RPA of one of the Lawson Cypress that form G6. To minimise the damage caused to this tree it will be necessary to carry out pre-emptive root pruning. This will involve excavating a line just outside the line of the edge of the car park, and pruning back any roots that are found to the edge of the cutting with a sharp hand saw or secateurs. This must be carried out under arboricultural supervision. It will also be necessary to reduce the crown of this element of G6 by a maximum of 1m on this side of the tree to provide sufficient clearance for the car park. The removal of a small tightly clipped Leyland Cypress hedgerow will also be required.</td>
</tr>
<tr>
<td>Installation Of New Mobile Classroom</td>
<td>A new mobile classroom will be installed to the north of the school buildings. The position that this classroom is shown as occupying is in the same position as four of the trees within the group G2. These trees will have to be removed for development purposes and replaced as set out in section 6 below.</td>
</tr>
</tbody>
</table>
6. Services and Soakaways

No details of any new service runs have been provided. However, they should be routed to avoid the RPAs of trees. If this is not possible, special techniques must be employed to place the services within the RPA of the trees. The British Standard suggests a range of trenchless methods suitable for various applications including microtunnelling, surface launched directional drilling, Pipe ramming and Impact Moleing/thrust boring. It is important common ducts should be used where it is not possible to avoid the RPA. Further guidance on installing underground services adjacent to trees can be found in the NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Volume 4 Issue 2). This document outlines a number of techniques that may be used for trenching near trees, including trenchless techniques, discontinuous trenching and hand digging.

It will be necessary to prepare detailed plans for any services that run thorough the RPA of retained trees. This should be produced in conjunction with an arboriculturist, and include allowance for the space needed for access for the installations, and the levels across the proposed area.

Any above-ground apparatus including CCTV cameras and lighting should also be positioned to avoid the need for any regular or detrimental pruning to the trees. Minor facilitative pruning is acceptable. However positions that require repetitive and significant tree work must be avoided.

6. Tree Management and Replacement Planting

6.1 No work to trees has been specified in column 10 of Appendix 1 for arboricultural or health and safety reasons. This schedule does not refer to, and is superseded by, any requirements for facilitative pruning or tree felling for development purposes that may be required when a final design is produced.

6.2 Any comments on the trees relating to health and safety remain valid for 12 months from the date of this report after which the trees will require re-inspection.

6.3 The development necessitates the removal of 4 B category trees (T10-12, T17), five C category trees (T5-7, T8, T9), four trees from group G4 and six trees from group G5. Two sections of Leyland Cypress hedgerow will also be removed during the development.

6.4 The individual trees will be replaced on a one-for-one basis with heavy standard (at least 12 to 14 cm stem diameter). Recommended species would include Field Maple ('Acer campestre 'Louise Red Shine'), Fastigiate Hornbeam ('Carpinus betulus 'Frans Fontaine'), Fastigiate Oak ('Quercus robur 'Fastigiata Koster'), Flowering Crab Apple ('Malus spp') or Hawthorn ('Crataegus laevigata 'Pauls Scarlet').
6.5 The heavy standard trees will be securely pit planted in holes which have been excavated to at least 0.3m larger in all dimensions than the rootball of the tree, back-filled with fresh topsoil. The trees will be supported with treated softwood stakes inserted at a 45 degree angle to the ground, avoiding the rootball. A rubber tie will secure the tree to the stake. Spiral guards will be wrapped around the lower stem to prevent mammal damage. Mulch will be placed around each tree at a diameter of 1m² to reduce weed growth.

6.6 New native hedging will be planted to replace the lost groups and hedgerows. This will be planted along the southern boundary of the site, and is the subject of a separate landscaping plan.

6.7 All trees and new planting will be maintained for a 5 year period. Work will include keeping an area of 1m² around each tree free from weed growth using herbicide or mulch, checking all supports and guards and replacing any failures that occur during the period with trees of the same species and quality.

7. Further Arboricultural Input into the Design Process, Construction and Aftercare

7.1 A Tree Protection Plan (TPP), Arboricultural Method Statement (AMS) and Timetable for implementation of Tree Protection Works form Appendices 4, 5 and 6 respectively.

7.2 The AMS contains a timetable for implementation of the tree protection works. No work will commence until the protective fencing is in place.

7.3 If the proposed layout for the site is changed, it will be necessary to revise this report.

8. Permissions and Constraints

8.1 The site is not currently within a Kettering Borough Council Conservation Area. It must be ascertained whether there are any Tree Preservation Orders on any trees within the site. If there are, written permission must be obtained from the Local Authority prior to commencing any work that may affect the condition of the protected trees.

8.2 To assist the planning process Kettering Borough Council should be provided with a copy of this report and invited to comment on the proposals.

8.3 When dealing with developments close to trees, special attention should be paid to related legislation ensuring that the Wildlife and Countryside Act (1994), Conservation of Habitats and Species Regulations (2010) and the Countryside Rights of Way Act (2000) are adhered to. It must be ensured that nesting birds and protected species such as bats and reptiles are considered and protected.
9. Conclusions

9.1 The trees on site are predominantly small and relatively recently planted.

9.2 New building and external works around the site will involve the removal of four B category trees and five C category trees. Sections of group G2 and G5 will also be removed, as will two sections of hedgerow.

9.3 Pre-emptive root pruning will be required to the Lawson Cypress group G6 for the extension of the car park.

9.4 Trees to be removed will be replaced on a one-for-one basis so that in time there will be little net loss in terms of biomass or amenity value.

9.5 A separate landscaping plan will be prepared for the southern boundary of the site.

G. G. Robbie, BSc Hons For, Tech Cert Arbor A
A.T. Coombes Associates
2nd April 2013
## APPENDIX 1-
### TREE SURVEY SCHEDULE

**SITE: GREENFIELDS PRIMARY SCHOOL, KETTERING**

**SURVEY COMPLETED: 04/01/13**

<table>
<thead>
<tr>
<th>Tree No.</th>
<th>Species</th>
<th>Ht (m)</th>
<th>Stem Dia (mm)</th>
<th>No of Stems</th>
<th>Branch Spread N</th>
<th>E</th>
<th>S</th>
<th>W</th>
<th>Height and Direction of First Branch (m)</th>
<th>Mean Canopy Ht</th>
<th>Life Stage</th>
<th>Physiological Condition</th>
<th>Structural Condition</th>
<th>Preliminary Tree work</th>
<th>Estimated remaining contribution (Yrs)</th>
<th>Cat grading</th>
<th>Radius of RPA (m)</th>
<th>RPA (sq m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Silver Birch</td>
<td>12.0</td>
<td>250</td>
<td>1</td>
<td>3.2</td>
<td>3.3</td>
<td>3.4</td>
<td>2.5</td>
<td>2.0 S</td>
<td>3.0</td>
<td>SM</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td></td>
<td>3.0</td>
<td>28.3</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>Norway Maple</td>
<td>6.5</td>
<td>120</td>
<td>1</td>
<td>2.3</td>
<td>1.8</td>
<td>2.5</td>
<td>2.5</td>
<td>3.0 N</td>
<td>3.5</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td></td>
<td>1.4</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>T3</td>
<td>Field Maple</td>
<td>6.7</td>
<td>190</td>
<td>1</td>
<td>3.3</td>
<td>3.1</td>
<td>4.0</td>
<td>5.0</td>
<td>2.0 W</td>
<td>3.5</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td></td>
<td>2.3</td>
<td>16.3</td>
<td></td>
</tr>
<tr>
<td>T4</td>
<td>Cherry</td>
<td>4.7</td>
<td>172</td>
<td>5</td>
<td>2.0</td>
<td>2.5</td>
<td>3.0</td>
<td>2.2</td>
<td>2.0 W</td>
<td>2.2</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td></td>
<td>2.1</td>
<td>13.4</td>
<td></td>
</tr>
<tr>
<td>T5</td>
<td>Himalayan Birch</td>
<td>8.0</td>
<td>140</td>
<td>6</td>
<td>2.9</td>
<td>2.4</td>
<td>2.2</td>
<td>2.4</td>
<td>1.5 E</td>
<td>2.0</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td></td>
<td>1.7</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
<td>T6</td>
<td>Silver Birch</td>
<td>5.0</td>
<td>100</td>
<td>1</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>1.7 N</td>
<td>2.0</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td></td>
<td>1.2</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>T7</td>
<td>Silver Birch</td>
<td>7.0</td>
<td>190</td>
<td>1</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>0.3 N</td>
<td>1.8</td>
<td>Y</td>
<td>Good</td>
<td>Moderate - One limb has snapped</td>
<td>No work required</td>
<td></td>
<td>2.3</td>
<td>16.3</td>
<td></td>
</tr>
<tr>
<td>T8</td>
<td>Alder</td>
<td>4.0</td>
<td>110</td>
<td>1</td>
<td>1.8</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>1.8 S</td>
<td>2.0</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td></td>
<td>1.3</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td>T9</td>
<td>Weeping Willow</td>
<td>5.7</td>
<td>140</td>
<td>1</td>
<td>2.7</td>
<td>2.7</td>
<td>2.7</td>
<td>2.7</td>
<td>1.6 S</td>
<td>2.0</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td></td>
<td>1.7</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
<td>T10</td>
<td>Cherry</td>
<td>9.0</td>
<td>490</td>
<td>1</td>
<td>4.5</td>
<td>4.7</td>
<td>4.0</td>
<td>5.0</td>
<td>2.5 S</td>
<td>3.0</td>
<td>M</td>
<td>Good</td>
<td>Moderate - Wound at 2.5m on east side with gummosis.</td>
<td>No work required</td>
<td></td>
<td>5.9</td>
<td>108.6</td>
<td></td>
</tr>
<tr>
<td>T11</td>
<td>Cherry</td>
<td>7.5</td>
<td>340</td>
<td>1</td>
<td>4.0</td>
<td>4.0</td>
<td>3.8</td>
<td>3.9</td>
<td>4.0 E</td>
<td>4.0</td>
<td>M</td>
<td>Good</td>
<td>Moderate - Bark damage at 3m on east side.</td>
<td>No work required</td>
<td></td>
<td>4.1</td>
<td>52.3</td>
<td></td>
</tr>
<tr>
<td>Tree No.</td>
<td>Species</td>
<td>ht</td>
<td>Stem dia</td>
<td>No of Stems</td>
<td>Branch Spread</td>
<td>Height and Direction of First Branch</td>
<td>Mean Canopy Ht</td>
<td>Life Stage</td>
<td>Physiological Condition</td>
<td>Structural Condition</td>
<td>Preliminary Tree work</td>
<td>Estimated remaining contribution (Yrs)</td>
<td>Cat grading</td>
<td>Radius of RPA (m)</td>
<td>RPA (sq m)</td>
<td></td>
<td></td>
<td></td>
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<td>-----------------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T12</td>
<td>Cherry</td>
<td>8.5</td>
<td>420</td>
<td>1</td>
<td>3.8 E</td>
<td>3.0 E</td>
<td>4.0</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>B1</td>
<td>5.0</td>
<td>79.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T13</td>
<td>Silver Birch</td>
<td>9.7</td>
<td>150</td>
<td>1</td>
<td>2.5 N</td>
<td>1.5 N</td>
<td>1.9</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>C1</td>
<td>1.8</td>
<td>10.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T14</td>
<td>Oak</td>
<td>10.0</td>
<td>370</td>
<td>1</td>
<td>5.0 S</td>
<td>4.0 S</td>
<td>4.5</td>
<td>EM</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>B1</td>
<td>4.4</td>
<td>61.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T15</td>
<td>Plum</td>
<td>9.0</td>
<td>370</td>
<td>1</td>
<td>4.5 S</td>
<td>2.5 S</td>
<td>2.5</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>B1</td>
<td>4.4</td>
<td>61.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T16</td>
<td>Blue Atlas Cedar</td>
<td>6.5</td>
<td>190</td>
<td>1</td>
<td>2.1 S</td>
<td>1.5 E</td>
<td>1.8</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>C1</td>
<td>2.3</td>
<td>16.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T17</td>
<td>Silver Birch</td>
<td>9.5</td>
<td>220</td>
<td>1</td>
<td>3.0 S</td>
<td>2.5 S</td>
<td>2.0</td>
<td>SM</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>B1</td>
<td>2.6</td>
<td>21.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T18</td>
<td>Silver Birch</td>
<td>12.5</td>
<td>300</td>
<td>1</td>
<td>4.5 S</td>
<td>4.0 S</td>
<td>4.5</td>
<td>EM</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>B1</td>
<td>3.6</td>
<td>40.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>Hornbeam / Ash / Field Maple</td>
<td>6.0</td>
<td>230</td>
<td>1</td>
<td>2.0 S</td>
<td>2.0 S</td>
<td>2.0</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>4</td>
<td>C1</td>
<td>2.8</td>
<td>23.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Wildlife Area (Hawthorn)</td>
<td>10.0</td>
<td>120</td>
<td>1</td>
<td>4.0 S</td>
<td>4.0 S</td>
<td>4.0</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>4</td>
<td>C1</td>
<td>1.4</td>
<td>6.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td>Poplar</td>
<td>18.0</td>
<td>630</td>
<td>1</td>
<td>3.0 S</td>
<td>3.0 S</td>
<td>3.0</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>B2</td>
<td>7.6</td>
<td>179.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>Leyland Cypress Group</td>
<td>18.0</td>
<td>250</td>
<td>1</td>
<td>3.5 S</td>
<td>3.5 S</td>
<td>3.5</td>
<td>EM</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>C2</td>
<td>3.0</td>
<td>28.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree No.</td>
<td>Species</td>
<td>Ht (m)</td>
<td>Stem dia (mm)</td>
<td>No of Stems</td>
<td>Branch Spread</td>
<td>Height and Direction of First Branch (m)</td>
<td>Mean Canopy Ht</td>
<td>Life Stage</td>
<td>Physiological Condition</td>
<td>Structural Condition</td>
<td>Preliminary Tree work</td>
<td>Estimated remaining contribution (Yrs)</td>
<td>Cat grading</td>
<td>Radius of RPA (m)</td>
<td>RPA (sq m)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>------------------</td>
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<td>------------------</td>
<td>----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G5</td>
<td>Field Maple / Birch</td>
<td>4.9</td>
<td>120</td>
<td>1</td>
<td>1.9 1.9 1.9 1.9</td>
<td>1.2 N</td>
<td>1.5</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>C1</td>
<td>1.4</td>
<td>6.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G6</td>
<td>Lawson Cypress</td>
<td>11.5</td>
<td>330</td>
<td>1</td>
<td>2.5 2.5 2.5 2.5</td>
<td>0.0 N</td>
<td>0.0</td>
<td>SM</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>C1</td>
<td>4.0</td>
<td>49.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G7</td>
<td>Field Maple</td>
<td>6.5</td>
<td>180</td>
<td>1</td>
<td>3.0 3.0 3.0 3.0</td>
<td>2.1 N</td>
<td>2.5</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>No work required</td>
<td>2</td>
<td>C1</td>
<td>2.2</td>
<td>14.7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### APPENDIX 2 - NOTES ON COLUMN HEADINGS IN APPENDIX 1

<table>
<thead>
<tr>
<th>Column No.</th>
<th>Title</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tree No.</td>
<td>Tree numbers to correspond with those shown on the TCP.</td>
</tr>
<tr>
<td>2</td>
<td>Species</td>
<td>Each tree has been identified and the common name given in each case.</td>
</tr>
<tr>
<td>3</td>
<td>Ht (m)</td>
<td>The tree height in metres to the highest point or tip measured from ground level.</td>
</tr>
<tr>
<td>4</td>
<td>Stem dia (mm)</td>
<td>The stem diameter measured in millimetres at 1.5 metres above ground.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For multi-stemmed trees the stem diameter has been calculated according to the formula given in BS 5837:2012: For trees with up to 5 stems, each stem has been measured at 1.5m, squared and added together. The diameter shown is the square root of the total. For Mulit-stemmed trees with over 5 stems a sample of five diameters has been taken at 1.5m, averaged and squared, then multiplied by the total number of stems. The square root of this sum gives the stem diameter figure.</td>
</tr>
<tr>
<td>5</td>
<td>Number of Stems</td>
<td>Total number of stems on the tree.</td>
</tr>
<tr>
<td>6</td>
<td>Branch Spread</td>
<td>The branch spread measured in metres from the stem to the tip of the outer branches has been measured in four directions of the compass North, South, East and West.</td>
</tr>
<tr>
<td>7</td>
<td>Height and direction of First Branch spread (m)</td>
<td>First significant branch and direction of growth (relative to the four cardinal compass points).</td>
</tr>
<tr>
<td>8</td>
<td>Canopy Ht</td>
<td>Mean height of the canopy above ground level.</td>
</tr>
<tr>
<td>9</td>
<td>Life Stage</td>
<td>The life stage of the tree has been assessed into one of the following categories: Y = Young, SM = Semi Mature, EM = Early Mature M = Mature, OM = Over mature and V = Veteran.</td>
</tr>
<tr>
<td>10 and 11</td>
<td>Condition</td>
<td>The British Standard recommends that a note is made of the <strong>structural</strong> and <strong>physical</strong> condition of the tree.</td>
</tr>
<tr>
<td>12</td>
<td>Preliminary Management Recommendations</td>
<td>This column includes all work considered necessary to, as far as is practicable, ensure health and safety and for the good arboricultural management of the trees. These works are not associated with the development proposals. All work to be carried out to BS 3998: 2010 “Tree Work-Recommendations”. Recommendations given in respect of Health and Safety remain current for 12 months from the date of this assessment after which further inspection is recommended. It should be noted that trees are dynamic structures subject to the forces of nature, which can fail without showing external symptoms.</td>
</tr>
</tbody>
</table>
The estimated remained contribution of each tree in years has been assessed, using personal experience, into the following groupings:

< 10 = Less than 10 years
10+ years = More than 10 years
20+ years = More than 20
40+ years = More than 40 years

(U = Those in such a condition that any existing value would be lost within 10 years and which should in the current context, be removed for reasons of sound arboricultural management.

(Trees that have serious, irremediable structural defects, such that their early loss is expected due to collapse or ill health including trees that will become at risk due to the loss of other U category trees).

A = Those trees of high amenity quality and value in such a condition as to be able to make a substantial contribution (A minimum of 40 years is suggested)

1. Trees that are particularly good examples of tree species if rare, unusual or essential components of groups or formal or semi formal arboricultural features

2. Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views in or out of the site, or those of particular visual importance.

3. Trees, groups or woodlands of significant conservation, historical, commemoratory or other value (e.g. veteran tree or wood pasture)

B = Those of Moderate quality and amenity value: those in such a condition as to a significant contribution (a minimum of 20 years is suggested)

1. Trees that might be included in the high category but are downgraded because of impaired condition (e.g. remediable defects)

2. Trees and woodland that forming distinct landscape features but do not form essential components

3. Trees with clearly identifiable conservation or other cultural benefits.

C = Those of low quality and amenity value currently in adequate condition to remain until new planting is established (minimum of 10 years is suggested).\ OR\ trees under 150 mm stem diameter.

1. Tree not qualifying in higher categories
### 14 cont...

<table>
<thead>
<tr>
<th>Category grading Cont.</th>
<th>2. Trees present in groups or woodlands but not with a significantly higher landscape value and or offering low or temporary screening benefit.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3. Trees with very limited conservation or other cultural benefits.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Category C trees are the least suitable for retention, where they would impose a significant constraint on the development their removal for development purposes may be considered acceptable by the LPA. Trees with a stem diameter under 150mm could be considered for relocation.</td>
</tr>
</tbody>
</table>

### 15 Radius of RPA (m)

The distance that would form the radius of a circular protection zone is given in metres calculated by multiplying the stem diameter given in column 4 by 12. The methods for calculating the stem diameter of multi-stemmed trees is given in section 4 above.

### 16 RPA (sq m)

The area of the RPA is given in square metres calculated by the following formula:

- **Single Stemmed Trees**
  
  \[
  RPA \text{ M}^2 = \left( \frac{\text{Stem diameter mm @ 1.5m } \times 12}{1000} \right)^2 \times 3.142
  \]

The methods for arriving at the stem diameter for multiple stemmed trees are described above in the notes for column 4.
APPENDIX 5

ARBORICULTURAL METHOD STATEMENT
FOR PROPOSED WORKS AT GREENFIELDS PRIMARY SCHOOL, KETTERING

1.0 SCOPE OF THE WORKS

1.1 The document provides a methodology for protection of trees during construction works at the above site, and should be read in conjunction with the Tree Protection Plan Appendix 4 and Timetable for Protection Works Appendix 6.

1.2 The main features in the protection of the retained trees on site are as follows:
   - Provision of Temporary Protective Barriers
   - Use of pre-emptive root pruning
   - Audited arboricultural site monitoring.

1.3 A meeting between the site manager/main contractor and a consulting arboriculturist must take place prior to construction work commencing so that the above protection measures set out in this document can be discussed and agreed. At this point a list of contact details for all relevant parties will be produced and circulated including the Tree Officer of the Local Planning Authority.

1.4 Protective measures must be in place prior to any ground or construction works take place.

2.0 TIMING OF WORKS

2.1 Tree protection works will be completed as detailed below according to the attached timetable Appendix 6.

2.2 The exact commencement date is not known however the timetable provided gives the order that the works need to be implemented to ensure the trees are fully protected and states when specific arboricultural input will be required.

3.0 TREE PROTECTION BARRIERS

3.1 Remaining trees will be protected by forming Construction Exclusion Zones (CEZ) as shown on Appendix 4 the Tree Protection Plan (TPP).

3.2 Temporary barriers will be erected as shown by the thick green lines on the TPP to form the CEZ. The barriers will consist of 2m tall welded mesh panels (Heras) supported on rubber or concrete feet. The fence panels should be joined together using a minimum of two anti-tamper couplers installed so they can be removed from the inside of the fence. The distance between couplers should be at least 1m and be uniform throughout the fence.

3.3 Panels should be supported on the inner side by stabilizer struts which should normally be attached to a base plate and secured with ground pins. Where the fence will be erected on hard surfacing or it is otherwise unfeasible to use ground pins the struts should be mounted on a block tray.
3.4 Fig 1 is an extract from BS5837:2012 showing the method of supporting the panels with ground pins and a block mounted tray for use on hard surfaces. Stabiliser struts should be fitted at each panel junction.

3.5 At least two all weather notices should be erected on the barriers forming each stating “Construction Exclusion Zone – No Access”. These should face outwards towards the work area. Signs must be maintained in good condition and remain in place until completion of the works.

3.6 Barriers will be maintained throughout the duration of the works, ensuring that access is denied to the CEZ throughout the process.

3.7 Barriers will be removed only when all construction work is completed.
4.0 PRE-EMPTIVE ROOT PRUNING

4.1 Pre-emptive root pruning will take place on the edge of the extended car park to avoid injurious damage to the root system of the neighbouring trees whilst excavating. This will be carried out by a suitably trained Arboriculturist.

4.2 An air spade will be used to excavate a trench along the edge of the proposed edge of the surfaced area. Any roots exposed will be cut back to the edge of the trench using a sharp handsaw or secateurs.

5.0 SITE HUTS AND TEMPORARY BUILDINGS

5.1 All site huts and temporary buildings will be sited out side the CEZ.

6.0 ADDITIONAL PRECAUTIONS

6.1 The movement of plant in proximity to retained trees should be conducted under the supervision of a banksman to ensure adequate clearance from the branches of the trees. Hydraulic cranes, forklifts, excavators or piling rigs (other than small rigs used for mini piling) must be avoided in the immediate vicinity the crown of the trees.

6.2 Cement, oil, bitumen or any other products which spillage would be likely to be detrimental to tree growth should be stored well away from the outer edge of the RPA of retained trees. Precautions should include ensuring all toxic liquids are stored in fully bunded containers. Equipment such as barriers or sandbags must be available on site to deal with any accidental spillages that may occur.

6.3 Lighting of fires on site should be avoided. Where they are unavoidable they must be at such a distance from retained trees that there is no risk of the heat causing fire damage to the trunk or branches. Full account must be taken of wind direction. Fires must be attended at all times until they are completely extinguished.

7.0 SERVICE TRENCHES

7.1 No details of new service runs have been provided at this stage. They should be routed to avoid the RPAs of trees. If this is not possible, special techniques must be employed to place the services within the RPA of the trees. The British Standard suggests a range of trenchless methods suitable for various applications including microtunnelling, surface launched directional drilling, Pipe ramming and Impact Moleing/thrust boring. It is important common ducts should be used where it is not possible to avoid the RPA. Further guidance on installing underground services adjacent to trees can be found in the NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Volume 4 Issue 2). This document outlines a number of techniques that may be used for trenching near trees, including trenchless techniques, discontinuous trenching and hand digging.

7.2 It will be necessary to prepare detailed plans for these services that should be produced in conjunction with an arboriculturist, and include allowance for the space needed for access for the installations, and the levels across the proposed area.
7.3 Any overground services including CCTV must also be positioned to avoid the need for any regular or detrimental pruning to the trees.

8.0 ARBORICULTURAL SUPERVISION AND AFTERCARE

8.1 Arboricultural/site monitoring will be carried out throughout the construction phase by a nominated arborist who will be responsible for consultation with the Local Authority’s Tree Officer.

8.2 The arborist will complete regular site visits to check that the tree protection measures are being carried out. The frequency of the visits will be dictated by the level of activity and degree to which the tree protection measures are being respected. A note of the date of each visit and a summary of the findings will be forwarded to both the Tree Officer and the Main Contractor to provide an audit trail enabling the proper implementation of the tree protection measures to be checked and verified.

8.3 There are three key stages where on-site arboricultural advice will be needed

1. Prior to commencement, to review the contents of the AMS, and deal with any queries the main contractor may have.
2. To confirm that the protective fencing is in place.
3. To supervise pre-emptive root pruning.

8.4 On completion of the works the trees will be inspected by the arborist to check the condition of the tree and advise if any remedial work is necessary.

A.T. Coombes Associates 24th January 2013
<table>
<thead>
<tr>
<th>Item</th>
<th>Operation *</th>
<th>Before Commencing Construction Works</th>
<th>During Construction Works</th>
<th>On Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carry out tree work as detailed in Appendix 1, and any tree felling as set out in the AIA.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Erect temporary protective fencing (Thick green line) on edge of the CEZ as specified in the AMS and TPP</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Erect warning signs on fencing around each CEZ stating “Construction Exclusion Zone - Keep Out”.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Maintain Protective fences and signs in good condition.</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Carry out pre-emptive root pruning adjacent to G6</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Arboricultural supervision and advice including site visits during the course of the works to check the CEZ and liaison with the Local Authority.</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7</td>
<td>Remove protective fencing</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>Check condition of the protected trees and consider if remedial works are necessary.</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td>Plant replacement trees.</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

* All work to comply with the attached Arboricultural Method Statement and BS5837: 2012 Trees in relation to design, demolition and construction - Recommendations*
Mark

My original e-mail has bounced back. I have omitted the external works drawing which I will issue separately.

Please see e-mail below.

Regards

Paul

Lend Lease is committed to operating Incident & Injury Free wherever we have a presence.

Mark

Further to our discussion we detail below the programme of supervision in relation to the tree protection measures.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Anticipated Date</th>
<th>Actions</th>
<th>Monitoring/Records</th>
<th>Responsible Parties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Start Meeting</td>
<td>July 2013</td>
<td>Requirements reinforced to Main Contractor</td>
<td>Included on the pre start meeting agenda and agreements included in the pre start meeting minutes</td>
<td>PHP – Rex Tunbridge/Oliver Bazeley LLC – Paul Tuff Main Contractor - TBA</td>
</tr>
<tr>
<td>Site Establishment (prior to construction activity commencing)</td>
<td>August 2013</td>
<td>Tree protection measures to be installed in line with the measures set out in the attached PHP drawing 4019 – 118 T1 Tree Protection Plan and the revised Arboricultural Report dated April</td>
<td>Project Arborist to attend site to ensure all protection measures are correctly installed.</td>
<td>Project Arborist – MLM (or equal approved) Main Contractor - TBA</td>
</tr>
<tr>
<td>Construction Phases (refer PHP drawing 4019 – 112 T2 GA Phasing Plan)</td>
<td>2013</td>
<td>Included on the monthly progress meeting agenda and any issues raised included in the monthly progress meeting minutes. (NB an e-mail including applicable photos and any remedial measures to be issued to the Planning Authority (and Ecology Planning representative) on a monthly basis.</td>
<td>PHP – Rex Tunbridge/Oliver Bazeley LLC – Paul Tuff Main Contractor - TBA</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Monthly between August 2013 – June 2014</td>
<td>Ensure tree protection measures are being correctly installed and maintained</td>
<td><strong>Pre - emptive root pruning</strong></td>
<td><strong>TBA (once Main Contractor is appointed)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Pre - emptive root pruning</strong></td>
<td><strong>Pre - emptive root pruning</strong></td>
<td>Project Arborist to attend site to ensure pre emptive root pruning is correctly undertaken.</td>
<td><strong>Project Arborist – MLM (or equal approved) Main Contractor - TBA</strong></td>
<td></td>
</tr>
</tbody>
</table>

In relation to our discussion on tree T17 we confirm that it is our intention to retain the tree by reducing the area of the tarmac to avoid the RPA. This will be discussed at the pre start meeting.

The above proposals relate to the Main Construction works. In relation to the installation of the mobile classroom the intention is to remove the four trees as identified on page 6 of the revised arboricultural impact assessment.

Regards

Paul
Key
- Existing Tree Retained: All existing to be screened with Herras Fencing during works.
- New Tree: Contractor to allow provisional sum for replacement of 19 no. trees removed during construction by specialist landscape subcontractor. Refer to Arborists report for requirements.
- Existing Tree Demolished: To be felled by others prior to commencement of contract. All felled waste, root ball & making good of ground. Refer to Arborists report for requirements.
- Existing Hedge Removed: To be removed by others prior to commencement of contract. All felled waste, root ball & making good of ground. Refer to Arborists report for requirements.
- Contractor exclusion zone: For duration of contract. No works to be carried out by the contractor within zones indicated.
- Root Protection Zone: Refer to Arboricultural report for details.
- Pre-emptive Root Pruning: Prior to construction. Refer to Arboricultural report for details.
- External Works: Refer to drawings 4019/112 & 117 for details of Phasing & Landscaping.
- Tree Protection Fencing: For duration of car park works (removal TBC).
- Tree Protection Fencing: For duration of mobile installation (removed 01/09/2013).
- Tree Protection Fencing: For duration of tarmac installation (removed 01/09/2013).
- New 1.8m high Palisade Fence.
- New 1.1m high White Picket Fence.
- HV Diversion Route (Note: all HV cable routes are indicative only).
- Tree Protection Fencing: For duration of car park works (removal TBC).
- Tree Protection Fencing: For duration of mobile installation (removed 01/09/2013).
- Existing HV cable removed (refer to Western Power Distribution Quote 1656593).
- Tree Protection Fencing: For duration of tarmac installation (removed 01/09/2013).
- Contractor to note: Temporary hoarding to be erected by contractor for works outside of site compounds (playgrounds & carparks etc) locations to be negotiated with School.
- All works to tie in to conform to BS 5837:2012.
- Note: root protection zone extended under existing path (retained).
- Note: new tarmac to avoid root protection zone of retained tree.