ARBORICULTURAL REPORT

Lings Primary School

REF: 12-2753/3614/D01/R v2
DATE: March 2013

Prepared For
Architecture Initiative Ltd

c/o Solange Design
3-5 Barrett Street
London
W1U 1AY

Prepared By
Lockhart Garratt Ltd

7-8 Melbourne House
Corbygate Business Park
Weldon, Corby
Northants NN17 5JG

Telephone: 01536 408840
Fax: 01536 408860
Email: info@lockhart-garratt.co.uk
Web: www.lockhart-garratt.co.uk
Northampton Schools – Wave 2

Arboricultural Implications and Tree Protection Scheme

CONTENTS

1 LINGS PRIMARY SCHOOL................................................................. 3
2 APPENDIX 1 - GENERIC ARBORICULTURAL METHOD STATEMENT ....... 5
3 APPENDIX 2 - TREE PROTECTIVE FENCING......................................... 12
4 APPENDIX 3 - FENCING STABILISATION............................................. 13
5 APPENDIX 4 - FENCING SIGNS............................................................. 14
6 APPENDIX 5 – PERMANENT GROUND PROTECTION ............................. 15
7 APPENDIX 6 – EXAMPLE METHODOLOGY FOR CONSTRUCTION OF SURFACE .............................................................. 17

This report must be read in conjunction with the relevant tree plans and schedules for each school.

A generic arboricultural method statement is provided in

Appendix 1 to address the process of tree protection on all sites covered by this report.

Attachments

<table>
<thead>
<tr>
<th>School</th>
<th>Tree Schedule</th>
<th>Tree Protection Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lings Primary School</td>
<td>D12-2786 080313 v1</td>
<td>D12-2785 080313 TPP v1</td>
</tr>
<tr>
<td>BS5837:2012 Cascade Chart</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1 Lings Primary School

This section should be read in conjunction with the relevant tree protection plan (D12-2785 TPP v1).

1.1 Arboricultural Implications

Surrounding Lings Primary School are a large number of mature and early mature trees primarily situated on the boundaries of the site, with the majority of the trees being located on the northern boundary of the school bordering Hayeswood Road.

No trees have been identified as requiring removal as part of the proposed new building layout. However, a total of six trees will be removed as part of this proposed scheme, to provide the necessary space to facilitate the construction of a new staff car park and cycle storage area.

Of the six trees to be removed two trees (T13 & T14) have been graded as Category U. It is recommended that these trees are removed, irrespective of this development proposal, due to structural defects. T13 is a poplar which has been heavily pollarded in the past and is showing poor signs of re-growth with a decay pocket evident on a wound at its base. T14 was noted to have significant decay at the stem junction. Neither of these trees are considered to have any long-term potential and the recommendation for their removal is not as a consequence of this development proposal.

Four trees (T8, T9, T11 & T12) have been graded as a Category C tree and their removal is necessary to create the space for the construction of the new parking site. T8 & T9 have no arboricultural merit and their loss will have no negative impact on the street scene. T8 is a young beech tree and is not located in a suitable location for the growth habits of the species and is likely to become a nuisance in the future. T9 (London Plane) has been heavily pollarded in the past due to it being located extremely close to the school for its size and will never be suited to its location.

T11 and to a lesser extent T12 do provide a visual screen from the adjacent Nethermead Court into the site. However they are considered to only be in fair condition with notable defects observed. Significant decay was noted in a stem wound on T11 and T12 was considered to have only a limited long term future. It is therefore recommended that these trees be removed to facilitate the proposed car parking layout and replace them with large broadleaf alternatives in a more suitable location. It is also worth noting that direct views into the site are already possible from No. 1-7 Nethermead Court.

One additional small tree will also be removed to create the access to the new staff car parking area. However, this tree is so small that it has not been included as part of this survey as the stem diameter is less than 75mm, the threshold for inclusion under BS5837:2012.

The proposed site layout will not impact the root protection area (RPA) of any further trees.

The proposed drainage scheme will not encroach the RPA of any retained tree on this site.
1.2 Tree Protection Scheme

The successful retention of those trees that will remain on the site will be dependent upon the quality and maintenance of any protection system that is put in place.

The protection of the trees on the northern side of the site can be achieved through the construction of a protective fence. This fence line has been marked on the attached tree protection plan as a white dashed line, and the enclosed area has been highlighted as a construction exclusion zone (CEZ). For a project of this nature, the Heras 151 system of fencing will provide the necessary protection (see below).

There are no requirements for remedial works to the trees as the canopies do not extend of the access area for site traffic.

The remaining trees on site will be protected either by the erection of a protective fence (as marked on the plan), or as a consequence of the construction of a secure compound within red line area, to exclude pupils and staff at the school from the areas of construction. The timing of construction operations has not been finalised and therefore the final details protective fencing in this area will be addressed in the Construction Management Plan and/or Design and Access Statement.

Where specific tree protective fencing is required on this site, it must be fit for the purpose of excluding any activity, person, material or machine associated with the construction tasks. For a site such as this, Heras fencing (Appendix 2) will be sufficient to provide this protection, provided that it is securely attached and cannot be moved. Appendix 3 provides a recommended method of stabilising such a fencing system as detailed by figure 3 of BS5837:2012. The feet must be anchored to the ground and the panels must be joined using a minimum of 2 brackets. Warning signs must be attached to the fencing stating its purpose. Appendix 4 gives an example of such signage.

All fencing must erected prior to any construction activity commencing, and must not be removed until all construction works have been completed. This means that all construction machinery and materials are removed from the site before the fence is removed. Once the fencing has been erected, there must be no access into the protected area (CEZ). Further details are provided in the generic method statement that accompanies this report.
Appendices

2 Appendix 1 - Generic Arboricultural Method Statement

2.1 Overview

The following explanations relate generically across all the sites covered in Wave 2 of the Northampton School development programme.

This AMS should be read in conjunction with the Tree Protection Plan (TPP) for each school.

A copy of this report must be kept on site and be permanently available for the duration of the development. It can be:

- Included in the tender documents to identify and quantify the tree protection and management requirements;
- Used to plan the timing of site operations to minimise the impact on trees, and;
- Referenced on site for practical guidance on how to protect trees.

2.2 Arboricultural Supervision

An arboricultural consultant will be appointed by the developer to advise on the tree management for each site where tree protection is required. The consultant will attend:

- The pre-commencement meeting before any works start;
- Regular supervision as agreed; and
- As needed to oversee specific works that could affect trees

Additionally the consultant may have a supervisory input into the following operations:

- Site preparation, including tree works
- Installation, maintenance and removal of barriers
- Installation, maintenance and removal of ground protection
- Installation of new surfaces
- Installation of new structures
- Installation of new landscaping

2.3 Sequencing and timing

Effective tree protection relies upon following a logical sequence of events and arboricultural inspection/supervision.

The retained arboricultural consultant’s initial role is to liaise with the developer and LPA to ensure the tree protection measures are fit for purpose and in place before any works commence on the site. Once the site is working that role will switch to monitoring compliance with arboricultural planning conditions and advising on any tree problems that arise or modifications that become necessary.
It is the developer’s responsibility to ensure that details of this AMS and any agreed amendments are known and understood by all site personnel.

The final details of supervision and the frequency of inspection visits will be agreed at the pre-commencement meeting. The supervision arrangement will be sufficiently flexible to allow the supervision of all sensitive works as they occur.

The arboricultural consultant will make a record of the visits and these will be attached to the site copy of the AMS for inspection. A further copy will be sent to the LPA. The purpose of these written records is firstly to provide proof of compliance that will allow the developer to robustly demonstrate adherence to best practice in the event of any dispute. Secondly it will help the LPA efficiently discharge the relevant planning conditions.

### Table 1 - Sequencing and Supervision

<table>
<thead>
<tr>
<th>Stage</th>
<th>Action</th>
<th>Arboricultural Input</th>
<th>Report Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-commencement meeting</td>
<td>Attend</td>
<td>2.4</td>
</tr>
<tr>
<td>2</td>
<td>Tree Works</td>
<td>N/A</td>
<td>2.5</td>
</tr>
<tr>
<td>3</td>
<td>Tree Protective Fencing</td>
<td>Inspect</td>
<td>2.6</td>
</tr>
<tr>
<td>4</td>
<td>Construction of special surfaces</td>
<td>N/A</td>
<td>2.7</td>
</tr>
<tr>
<td>5</td>
<td>Specific tree protection measures</td>
<td>Inspect</td>
<td>2.8</td>
</tr>
<tr>
<td>6</td>
<td>Demolition</td>
<td>N/A</td>
<td>2.9</td>
</tr>
<tr>
<td>8</td>
<td>Development Phase</td>
<td>Supervise</td>
<td>2.10</td>
</tr>
<tr>
<td>9</td>
<td>Remove temporary surfaces</td>
<td>N/A</td>
<td>2.11.1</td>
</tr>
<tr>
<td>10</td>
<td>Remove tree protective fencing</td>
<td>Supervise</td>
<td>2.11.2</td>
</tr>
<tr>
<td>11</td>
<td>Landscaping &amp; replacement planting</td>
<td>Discuss with landscape architect</td>
<td>2.11.3</td>
</tr>
</tbody>
</table>

#### 2.4 Pre-commencement meeting

A pre-commencement site meeting involving the land owner, architect, arboricultural consultant, contractors and engineers (as appropriate), and relevant LPA officers will be held to ensure that all aspects of the tree protection processes are understood and agreed.

The meeting is where the details of the programme of tree protection will be agreed and finalised, which will then form the basis of any supervision arrangements between the arboricultural consultant and the developer.

The arboricultural consultant will send a record of the meeting to all parties.

#### 2.5 Tree Removal and Works

The day to day running of the site will take full account of the tree protection measures set out in this document. All site personnel will be briefed on the tree protection requirements as part of the site induction procedure.

The tree management has been specifically designed towards doing the minimum work necessary to accommodate the development structures, establish acceptable levels of safety and reduce the destructive impact of existing trees on adjacent, better trees.
All tree works will be carried out by a suitably qualified contractor, and in accordance with BS3998:2010 *Tree Works – Recommendations* and industry best practice.

### 2.5.1 Tree Removal

Any trees to be removed are highlighted on each tree protection plan by a red, dashed circle around each tree and a red number.

### 2.5.2 Tree works

No tree works are required, but minor pruning may be necessary to address unanticipated local problems with individual branches. Any additional works will be assessed and authorised as necessary by the retained arboricultural consultant who will liaise as required with the county council senior environmental planner.

### 2.6 Barriers and Ground Protection

#### 2.6.1 The Construction Exclusion Zone

The primary means of protecting the Root Protection Area (RPA) of trees is through the use of barriers formed by protective fencing. The enclosed area is the Construction Exclusion Zone (CEZ).

The CEZs are to be afforded protection at all times and will be protected by fencing. The type of fencing is detailed in section 2.6.2, below.

No works will be undertaken within any CEZ that causes compaction to the soil or severance of tree roots.

#### 2.6.2 Tree Protective Fencing

A protective fence will be erected around the trees, prior to the commencement of any site works e.g. before any materials or machinery are brought on site, development or the stripping of soil commences.

The fence will have signs attached to it stating that this is a CEZ and that no works are permitted within the fence (see Appendix 4). No notice boards, cables or other services will be attached to any tree.

The fence is to be sited in accordance with the TPP provided for each site. This is shown as a pink dotted line with diagonal orange hatching indicating the enclosed CEZ (where necessary).

For a project of this nature, it has been determined that Heras fencing will provide the necessary level of protection to the trees, where circumstances require. Details of this type of fencing are provided in Appendix 2, and a method of bracing this type of fence is detailed in Appendix 3.

After the protective fencing and temporary ground protection has been erected, the retained arboricultural consultant will visit the site. The purpose of the visit will be to check that the fencing has been correctly installed so as to provide protection to the trees.

The retained arboricultural consultant will provide a written report confirming satisfactory completion of this task. A copy of this report will be sent to the local planning authority.
The protective fence may only be removed following completion of all construction works.

2.7 Construction of special surfaces

2.7.1 Temporary Ground Protection

If temporary access is required to a CEZ then access may only be gained after consultation with the Local Planning Authority and following placement of materials that will spread the weight of any vehicular load and prevent compaction to the soil.

For pedestrian movements within any CEZ then a single thickness scaffold board on top of a compressible layer (eg wood chip mulch) laid onto a geotextile fabric may be acceptable.

2.7.2 Permanent hard surfaces within the RPA

Where permanent hard surfaces are required within the RPA, there must be for no excavation into the soil, either through the lowering of levels and/or scraping, other than the removal of turf or other surface vegetation. All such works shall be carried out using hand tools only.

The structure of the surface is designed to avoid localised compaction by distributing the weight of vehicles evenly through the structure. Illustrative examples of types of permanent ground protection are included in Appendix 5, and an example of a method of construction is given in Appendix 6. Whatever the choice of method, the end result must be that the underlying soil (rooting environment) remains undisturbed and retains the capacity to support existing and new roots.

One tree (T15) will require permanent protection as it the access to new properties will encroach this RPA. The area for permanent ground protection has been highlighted on the TPP by purple cross-hatching.

2.7.3 Additional precautions outside the exclusion zone

Any risk from activities outside RPAs but close enough to have an impact will be assessed during the day-to-day running of the site, and appropriate precautions put in place to reduce that risk.

It is a presumption of this report that all RPAs that have been identified for protection but which lie outside of the protective fencing, will be protected from soil degradation at all times during construction activity.

2.8 Specific tree protection measures

2.8.1 Inspection

After the protective fencing and temporary ground protection has been erected, the retained arboricultural consultant will visit the site. The purpose of the visit will be to check that the fencing has been correctly installed so as to provide protection to the trees. The county council senior environmental planner will also be invited to inspect the tree protection measures prior to any works commencing.

The retained arboricultural consultant will provide a written report confirming satisfactory completion of this task. A copy of this report will be sent to the local planning authority.
2.9 Demolition

There are no demolition works required within or in close proximity to any retained trees on this site.

2.10 Development

Once all trees works and protective fencing have been completed, the developer can commence the on-site preparation works and construction can begin.

2.10.1 Site Storage, Cement Mixing and Washing Points

No storage of materials will take place within a CEZ.

No mixing or storage of materials will take place up a slope where they may leak into a CEZ. Where contours of the site create a risk of polluted water running into RPAs, precautionary measures of using heavy duty plastic sheeting and sandbags with the ability to contain accidental spillage will be put in place to prevent contamination.

2.10.2 Contractors Parking

Contractors parking will be off-site and will not be within or in close proximity to a CEZ.

2.10.3 Utility Services

All utility services will connect internally to the property. There is no requirement for any service to be installed within a CEZ.

2.10.4 Fires

No fires will be lit on this site.

2.10.5 Site Gradient

There will no changes to any levels on this site.

2.10.6 Use of Herbicides

There is no requirement for any herbicide to be used on this site.

2.10.7 Use of Sub-contractors

The main contractor will be responsible for ensuring sub-contractors do not carry out any process or operation that is likely to adversely impact upon any tree on site.

2.10.8 Contingency planning

Water will be kept readily available on site and will be used to flush spilt materials through the soil and avoid contamination to tree roots.

At the time of any spillage the main contractor will contact the retained arboricultural consultant for advice.
2.11 Post Development

2.11.1 Removal of temporary surfaces
All temporary surfaces will remain in place until all construction activity is finished and there is no realistic risk of damage.

Any ground protective measures will be removed progressively, starting at the furthest point from the temporary access road, and working backwards. All operations will take place from on top of the existing temporary surface. This will need to be done carefully to ensure that there is no excavation in the original surface level and there will be no damage to trees.

Once this material has been removed there will be no vehicular access to the site by this route.

2.11.2 Removal of protective fencing
When the development is complete, all drainage and service runs are in place and the main site machinery has been removed, the CEZ protective fencing will be dismantled.

This will be supervised by the retained arboricultural consultant to ensure that no damage to done to the protected areas during this process.

2.11.3 Landscaping within the RPA.
The final tidying up and reinstatement can only be carried out when all the protective measures have been removed. This means great care is required by the contractors to observe tree protection measures.

No machines can be used within the RPAs, which specifically excludes rotavators.

All new planting and soil level variations must be agreed and supervised by the retained arboricultural consultant.

2.11.4 Replacement planting and transplanting of existing trees
All replacement planting will be undertaken in accordance with the detailed recommendations laid down in Section 7 (Amenity Tree Planting) of BS4428 (1989) – Code of practice for general landscape operations (excluding hard surfaces).

2.12 Responsibilities

It is the responsibility of the main contractor to ensure that the planning conditions attached to planning consent are adhered to at all times and that a monitoring regime in regards to tree protection is adopted on site.

The main contractor will be responsible for contacting the Local Planning Authority at any time issues are raised related to the trees on site.

If at any time pruning works are required permission must be sought from the Local Planning Authority first and then carried out in accordance with BS3998:2010 Tree Works – Recommendations and industry best practice.
The main contractor will ensure the build sequence is appropriate to ensure that no damage occurs to the trees during the construction processes. Protective fences will remain in position until completion of ALL construction works on the site.

The fencing and signs must be maintained in position at all times and checked on a regular basis by an on-site person designated that responsibility.

2.13 Completion meeting

Upon completion of all works specified above and all procedures detailed, the Arboricultural Consultant will invite the county council senior environmental planner to meet on site to discuss the process and agree any final remedial works which may be required.

2.14 Contacts

Shows a list of all relevant contacts for this development:

<table>
<thead>
<tr>
<th>Title</th>
<th>Name</th>
<th>Contact No.</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landowner/Developer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agent/Architect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LPA Case Officer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LPA Tree Officer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site Manager</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arboricultural Consultant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecological Consultant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape Designer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree Surgeon</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THIS AMS IS NOT A CONTRACT. THE RETENTION OF A QUALIFIED ARBoriculturist FOR SUPERVISION AND MONITORING MUST BE AGREED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY.
3 Appendix 2 - Tree Protective Fencing
4 Appendix 3 - Fencing Stabilisation

Figure 3  Examples of above-ground stabilizing systems

a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray
5 Appendix 4 - Fencing Signs
6 Appendix 5 – Permanent Ground Protection

**CellWeb™**

Tree Root Protection System

The CellWeb™ TRP cellular confinement system protects tree roots from the damaging effects of compaction and desiccation, while creating a stable, load-bearing surface for vehicular traffic.

CellWeb™ offers an alternative to the traditional methods of constructing roads and building foundations that involve excavation, which can result in tree root severance and soil compaction from the passage of vehicles. Such damage can severely influence tree health, and in extreme cases, leads to death. CellWeb™ can be sensitively installed close to and under the canopies of trees without negative effects.

Trees are valuable landscape features and a vital environmental resource. Increasingly, contractors are being required to ensure the health and survival of trees curing and beyond the construction period. Although this is enshrined in BS 5837: Trees in Relation to Construction: Recommendations (2005) and Tree Preservation Order legislation, it presents several issues when implementing construction projects near to trees:

- Root severance caused by excavation, leaving trees open to decay, less stable and with a diminished capacity to utilise soil water and nutrients.
- Destruction of soil structure and compaction due to the passage of heavy vehicles, restricting the flow of water and air to tree roots.
- Need for construction access, new roadways and hard surfaces that require engineering-standard load-bearing foundations that meet building regulations.
- Need for high-performance, cost-effective driveways and roadways in the vicinity of tree roots.

The CellWeb™ system overcomes these issues and helps contractors to comply with tree health guidelines by creating a load-bearing base that is water-permeable, stable and durable.

With no need for excavation, the system is quick and easy to install, reducing construction time and saving costs and making it suitable for temporary and permanent solutions.

![Image of CellWeb system in action]

Glymbourne Wood. Residential pathway remodelled and built using a CellWeb™ foundation which was covered with ballast and then filled with woodchip to create a porous surface.
**Product features**

CellWeb™ comprises an expandable cellular mattress that is then filled with a clear stone sub-base and above a Tretoor T300 Geotextile.

The honeycomb-like structure is made of robust high-density polyethylene (HDPE) that is simply stretched out and filled with clean angular material. Just like traditional roadways, the strength of the structure comes from the binding together of the infill, but with CellWeb™ this is achieved without compaction and without reduction in permeability.

Perforated cell walls allow the angular infill to bind with the contents of the adjacent cell, but with sufficient space for the movement of water and air to nearby tree roots. As the infill contains no fines and the geometric layers prevent clogging from particles washing into the system, the structure remains permeable to water over time and protects the roots for the lifetime of the tree.

As well as being quick and easy to install, CellWeb™ also dramatically cuts down the depth of sub-base required, in most cases by as much as 50%, further reducing costs. CellWeb™ significantly reduces surface settling, increasing the long-term performance of the finished surface and ensuring that tree roots remain protected from vertical loads.

CellWeb can be used as a permanent solution or alternatively the system can be used in a temporary situation. In a temporary application, the system can be used for the required period of time, then removed for use on another site or recycled, thereby adding to CellWeb’s green credentials.

---

**Please call**

**01455 617 139**

or email sales@geosyn.co.uk for further information.
7 Appendix 6 – Example methodology for construction of surface

(This document has been produced by Geosynthetics Ltd for the installation of the Cellweb Tree Root Protection System – it does not apply to other products which may serve a similar purpose).

When considering damage to tree roots, in applications of vehicular access and parking, the risk of oxygen depletion caused by compaction of subsoil's, site clearance damaging the root source and type of reinforcement are areas which need to be given due consideration.

Other risk factors are:

- Creating an impermeable surface
- Causing a rise in the water table due to construction
- Increasing ground level
- Contamination of subsoil's

1. Compaction

When looking at site conditions and use, the following information should be considered to enable a load bearing structure capable of supporting traffic to be proposed:
- Californian Bearing ratio (CBR) – Standard test method for measuring soil strength

- Soil types

- Water table

- Maximum load (vehicles)

- Acceptable rut depth

- Reinforcement type

<table>
<thead>
<tr>
<th>Type and Depth of engineered infill material</th>
<th>Cellweb Cellular Confinement 150mm deep</th>
</tr>
</thead>
</table>

2. Dig (site strip)

Site stripping does damage some root structure prior to construction; however, the use of no-dig construction elevates the access road requiring edge protection.

3. No dig

3.1. Remove surface vegetation

| Use a suitable herbicide suitable for the specific vegetation and not harmful to the tree root system |

3.2. Place geotextile separation filtration layer

| Use a Treetex T300 non woven Goetextile over the prepared sub-grade. Overlap dry joints by 300mm. |

The three dimensional cell structure, is formed by ultrasonically welding polyethylene (perforated) strips / panels together to create a three dimensional network of interconnecting cells. A high degree of frictional interaction is developed between infill and the cell wall, increasing the stiffness of the system.

3.4. Edge restraint

| A treated timber edging is usually acceptable. |

Expand the Cellweb 2.56m wide panels to the full 8.1 metre length. Pin the Cellweb panels with staking pins to anchor open the cells and staple adjacent panels together to create a continuous mattress. Infill the Cellweb with a no fines angular granular fill (typically 4-20mm) within each open cell. The use of cellular confinement reduces the bearing pressure on the subsoil by stabilising aggregate surfaces against rutting under wheel loads. Comparisons between cellular confinement and traditional aggregate and geogrid-reinforced structures demonstrate a 50% reduction in construction thickness of the granular material.

5. Surfacing Options

**Block Paving:**

5.1. Lay second layer of Treetex T300 Geotextile separation fabric over the infilled Cellweb sections

5.2. Lay sharp sand bedding layer compacted with a vibro compaction plate to recommended depth.

5.3. Place block paviors as per manufacturers instructions.

**Tarmac:**

Place 25mm surcharge of the granular material above the Cellweb system and lay the bitumen base and wearing courses.

**Loose Gravel:**

5.4. Ensure Cellweb is completely filled.

5.5. Place decorative aggregate to required depth

NOTE: A treated timber edge should be provided to restrict gravel movement.
**Grass Blocks:**

5.6. Place second layer of Treetex T300 Geotextile separation fabric over the infilled Cellweb sections

5.7. Place 50/50 rootzone bedding layer to the required depth

5.8. Lay recycled Duo Block 500 Grass Protection System infilled with 50/50 rootzone mix.

5.9. Seed as per architects instructions.

(Alternatively the Grass Blocks may be infilled with gravel.)

**Concrete Slab**

6.0 Lay Cellweb as previous and place second layer of Treetex Geotextile directly over the filled panels. Pour concrete base as specified.

Below are illustrations of the correct stapling procedure for joining both edges and ends of panels together:

If you have any queries about installation please contact Geosynthetics Ltd on 01455 617139
<table>
<thead>
<tr>
<th>No</th>
<th>Species</th>
<th>H</th>
<th>Stem Dia</th>
<th>Branch Spread</th>
<th>C.C.</th>
<th>Age Class</th>
<th>Physiological Condition</th>
<th>Structural Condition</th>
<th>Comment &amp; Preliminary recommendations</th>
<th>U.L.E.</th>
<th>Cat.</th>
<th>RPA (m²)</th>
<th>Radial Distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Norway maple</td>
<td>8</td>
<td>360</td>
<td>5 2 5 6</td>
<td>EM</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
<td>Multi-stemmed at 2.5m with a balanced crown. Over hanging boundary and footpath. Pruned leaving stubs. No major visible defects.</td>
<td>40+</td>
<td>C1</td>
<td>58.6</td>
<td>4.3</td>
</tr>
<tr>
<td>2</td>
<td>Norway maple</td>
<td>10</td>
<td>530</td>
<td>6 7 7 6</td>
<td>M</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
<td>Multi-stemmed at 2m with a balanced crown. Over hanging boundary and footpath. No major visible defects.</td>
<td>40+</td>
<td>B2</td>
<td>127.1</td>
<td>6.4</td>
</tr>
<tr>
<td>3</td>
<td>Norway maple</td>
<td>9</td>
<td>350</td>
<td>4 4 5 5</td>
<td>EM</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
<td>Single stemmed leaning with a balanced crown. No major visible defects.</td>
<td>40+</td>
<td>B2</td>
<td>55.4</td>
<td>4.2</td>
</tr>
<tr>
<td>4</td>
<td>Silver birch</td>
<td>6</td>
<td>140</td>
<td>2 3 3 2</td>
<td>Y</td>
<td>Y</td>
<td>Fair</td>
<td>Fair</td>
<td>Single stemmed leaning with a balanced crown. Historical stemmed wound at base with no decay present.</td>
<td>20-40</td>
<td>C2</td>
<td>8.9</td>
<td>1.7</td>
</tr>
<tr>
<td>5</td>
<td>Silver birch</td>
<td>8</td>
<td>190</td>
<td>3 4 3 4</td>
<td>EM</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
<td>Single stemmed leaning with a balanced crown. Minor deadwood. No major visible defects.</td>
<td>40+</td>
<td>C2</td>
<td>16.3</td>
<td>2.3</td>
</tr>
<tr>
<td>No</td>
<td>Species</td>
<td>H (m)</td>
<td>Stem Dia (mm)</td>
<td>Branch Spread (N / E / S / W)</td>
<td>C.C. (m)</td>
<td>Age Class</td>
<td>Physiological Condition</td>
<td>Structural Condition</td>
<td>Comment &amp; Preliminary recommendations</td>
<td>U.L.E.</td>
<td>Cat.</td>
<td>RPA (m³)</td>
<td>Radial Distance (m)</td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------</td>
<td>-------</td>
<td>---------------</td>
<td>-------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>------------------------</td>
<td>---------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
<td>------</td>
<td>----------</td>
<td>---------------------</td>
</tr>
<tr>
<td>G6</td>
<td>Silver birch and Norway maple</td>
<td>To 11</td>
<td>100</td>
<td>- / - / - / -</td>
<td>1.5</td>
<td>Y-M</td>
<td>Good</td>
<td>Good</td>
<td>Boundary group of trees. No major visible defects.</td>
<td>40+</td>
<td>B2</td>
<td>4.5</td>
<td>1.2</td>
</tr>
<tr>
<td>7</td>
<td>Silver birch</td>
<td>6</td>
<td>160</td>
<td>2 / 2 / 2 / 2</td>
<td>2</td>
<td>Y</td>
<td>Good</td>
<td>Good</td>
<td>Twin stemmed at 1.2m with a balanced crown. No major visible defects.</td>
<td>20-40</td>
<td>C1</td>
<td>11.6</td>
<td>1.9</td>
</tr>
<tr>
<td>8</td>
<td>English beech</td>
<td>5</td>
<td>150</td>
<td>4 / 2 / 1 / 3</td>
<td>1.5</td>
<td>Y</td>
<td>Fair</td>
<td>Good</td>
<td>Single stemmed leaning with a balanced crown. Crown lifted now occluding well.</td>
<td>20-40</td>
<td>C1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>9</td>
<td>London plane</td>
<td>10</td>
<td>480</td>
<td>6 / 5 / 4 / 3</td>
<td>1</td>
<td>M</td>
<td>Fair</td>
<td>Good</td>
<td>Twin stemmed at 3.5m with an un-balanced crown. Pollarded in the past. Good re-growth evident at cut points. Occluding slowly.</td>
<td>20-40</td>
<td>C1</td>
<td>104.2</td>
<td>5.8</td>
</tr>
<tr>
<td>10</td>
<td>Norway maple</td>
<td>9</td>
<td>370</td>
<td>3 / 7 / 6 / 5</td>
<td>2</td>
<td>M</td>
<td>Fair</td>
<td>Good</td>
<td>Multi-stemmed at 3m with an un-balanced crown. No major visible defects.</td>
<td>20-40</td>
<td>C1</td>
<td>61.9</td>
<td>4.4</td>
</tr>
<tr>
<td>11</td>
<td>Norway maple</td>
<td>9</td>
<td>490</td>
<td>7 / 8 / 5 / 6</td>
<td>2</td>
<td>M</td>
<td>Fair</td>
<td>Fair</td>
<td>Multi-stemmed at 2m with a un-balanced crown. Pruning scar with decay at stem junction. Minor deadwood. Overhanging boundary and footpath.</td>
<td>20-40</td>
<td>C1</td>
<td>108.6</td>
<td>5.9</td>
</tr>
<tr>
<td>No</td>
<td>Species</td>
<td>H (m)</td>
<td>Stem Dia (mm)</td>
<td>Branch Spread (N / E / S / W)</td>
<td>C.C. (m)</td>
<td>Age Class</td>
<td>Physiological Condition</td>
<td>Structural Condition</td>
<td>Comment &amp; Preliminary recommendations</td>
<td>U.L.E.</td>
<td>Cat.</td>
<td>RPA (m²)</td>
<td>Radial Distance (m)</td>
</tr>
<tr>
<td>----</td>
<td>--------------------</td>
<td>-------</td>
<td>---------------</td>
<td>-------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>------------------------</td>
<td>---------------------</td>
<td>-----------------------------------------------------------------</td>
<td>--------</td>
<td>------</td>
<td>-----------</td>
<td>---------------------</td>
</tr>
<tr>
<td>13</td>
<td>Poplar</td>
<td>7</td>
<td>620</td>
<td>2 2 2 2</td>
<td>2</td>
<td>M</td>
<td>Poor</td>
<td>Poor</td>
<td>Twin-stemmed at 3.5m with a balanced crown. Heavily pollarded, with poor re-growth. Likely to have weak unions. Large cut at base with decay. Bat box on southern side of main stem. Limited long term future.</td>
<td>&gt;10</td>
<td>U</td>
<td>173.9</td>
<td>7.4</td>
</tr>
<tr>
<td>14</td>
<td>Willow</td>
<td>5</td>
<td>360</td>
<td>4 4 4 4</td>
<td>3 1</td>
<td>M</td>
<td>Poor</td>
<td>Fair</td>
<td>Multi-stemmed at 1m with a balanced crown. Branch stubs with significant decay. Cavity with decay at stem junction. Crossing branches. Limited long term future.</td>
<td>&gt;10</td>
<td>U</td>
<td>58.6</td>
<td>4.3</td>
</tr>
<tr>
<td>15</td>
<td>Norway maple</td>
<td>10</td>
<td>540</td>
<td>6 6 3 6 4</td>
<td>4</td>
<td>M</td>
<td>Fair</td>
<td>Good</td>
<td>Multi-stemmed at 2m with a balanced crown. Crown lifted in the past. Over hanging boundary. Situated on banking.</td>
<td>20-40</td>
<td>C2</td>
<td>131.9</td>
<td>6.5</td>
</tr>
<tr>
<td>16</td>
<td>Norway maple</td>
<td>10</td>
<td>430</td>
<td>1 4 5 6 4</td>
<td>4</td>
<td>M</td>
<td>Fair</td>
<td>Good</td>
<td>Multi-stemmed at 2m with a balanced crown. Crown lifted in the past. Over hanging boundary. Situated on banking. Sign screwed onto western side of main stem.</td>
<td>20-40</td>
<td>C2</td>
<td>83.6</td>
<td>5.2</td>
</tr>
<tr>
<td>17</td>
<td>Silver birch</td>
<td>12</td>
<td>400</td>
<td>4 4 4 4 4</td>
<td>2</td>
<td>M</td>
<td>Good</td>
<td>Good</td>
<td>Twin-stemmed at 3m with a balanced crown. Thinning upper crown. Crown pruned in the past with good re-growth evident.</td>
<td>20-40</td>
<td>C1</td>
<td>72.4</td>
<td>4.8</td>
</tr>
<tr>
<td>18</td>
<td>Hornbeam</td>
<td>9.5</td>
<td>370</td>
<td>2.5</td>
<td>5 5 5 5 2.5</td>
<td>EM</td>
<td>Good</td>
<td>Good</td>
<td>Multi-stemmed at 1.5m with a balanced crown. Rope swing attached. No major visible defects.</td>
<td>40+</td>
<td>C1</td>
<td>61.9</td>
<td>4.4</td>
</tr>
<tr>
<td>No</td>
<td>Species</td>
<td>H (m)</td>
<td>Stem Dia (mm)</td>
<td>Branch Spread (N / E / S / W)</td>
<td>C.C. (m)</td>
<td>Age Class</td>
<td>Physiological Condition</td>
<td>Structural Condition</td>
<td>Comment &amp; Preliminary recommendations</td>
<td>U.L.E.</td>
<td>Cat.</td>
<td>RPA (m²)</td>
<td>Radial Distance (m)</td>
</tr>
<tr>
<td>----</td>
<td>--------------------</td>
<td>-------</td>
<td>---------------</td>
<td>-------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>------------------------</td>
<td>---------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
<td>------</td>
<td>----------</td>
<td>---------------------</td>
</tr>
<tr>
<td>19</td>
<td>Norway maple</td>
<td>5</td>
<td>260</td>
<td>2 2 2 2</td>
<td>2</td>
<td>Y</td>
<td>Fair</td>
<td>Fair</td>
<td>2 No. trees, both twin stemmed at 0.5m with balanced crowns. Crown lifted. Included bark at stem junction.</td>
<td>10-20</td>
<td>C1</td>
<td>30.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Category and definition</td>
<td>Criteria (including subcategories where appropriate)</td>
<td>Identification on plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------------------</td>
<td>-----------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trees unsuitable for retention (see Note)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category U</td>
<td>Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality</td>
<td>See Table 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>NOTE</strong> Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trees to be considered for retention</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category A</td>
<td>Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)</td>
<td>Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features</td>
<td>See Table 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trees of high quality with an estimated remaining life expectancy of at least 40 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category B</td>
<td>Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation</td>
<td>Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality</td>
<td>See Table 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trees of moderate quality with an estimated remaining life expectancy of at least 20 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category C</td>
<td>Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories</td>
<td>Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits</td>
<td>See Table 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>