Arboricultural Implications Assessment
Futurist Theatre, Scarborough
June 2017

Draft Report

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Field Investigations and Data

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by EcoNorth Ltd. for inaccuracies in the data supplied by any other party.

Declaration of Compliance

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Non-Technical Summary

EcoNorth Ltd., was commissioned by Willmott Dixon Construction Limited to supply a BS 5837 tree survey at Futurist Theatre, Scarborough, North Yorkshire.

The site has been surveyed in accordance with BS 5837:2012 ‘Trees In Relation to Construction – Recommendations’ to provide detailed, independent, arboricultural advice on the trees present, in the context of potential development.

The tree protection measures given in this report should be implemented to ensure tree health and safety. It is strongly recommended that the arboricultural protection measures are clearly communicated to the entire construction team prior to commencement – this process should involve the Local Planning Authority so as to ensure any planning conditions are not breached. This is most effectively managed by monitoring the development on a regular basis, checking tree protection measures in relation to the Tree Protection Plan & Arboricultural Method Statement(s) and reporting to the LPA on a monthly basis.

Of the surveyed vegetation, 1 tree was of the highest value category ‘A’. 5 trees surveyed are classified as category ‘B’, with 4 in retention category ‘C’ and the 2 groups in category ‘U’ for removal.

The British Standard recommends that higher value category ‘A’ and ‘B’ trees should be retained, where possible, and protected throughout any new development. If this is not possible, then replacement planting is essential. The ‘C’ category trees will likely need to be removed depending on the site working requirements.

The construction works will impact on a small number of nearby trees and will require the removal of several mature, category B trees. The loss of these big trees will impact negatively on the amenity value of this site and the immediate surrounding area to some extent. The remaining trees surveyed should not cause any nuisance to the property or hinder the development process.
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1. Introduction

1.1 Background

EcoNorth Ltd., was commissioned by Willmott Dixon Construction Limited to supply a BS 5837 tree survey at The Futurist, Scarborough, North Yorkshire (grid reference TA 0448 8857). This report assesses the value of trees on the proposed development site and informs on relevant protection measures during construction.

Specifically this report:

- Provides an Arboricultural Impact Assessment with regards to the proposal
- Recommends measures that will suitably protect retained trees during the development process
- Recommends an appropriate level of mitigation and/or compensation where necessary

The report is based on the following drawings and documents:

- Site plan provided by © Crown copyright and database rights 2017. Ordnance Survey 100048957
- BS5387 Tree Survey (EcoNorth, 2017)
- Open Street Mapping (Copyright free)

1.2 Site Context

The site is located on a steep, east facing coastal embankment and a level area behind the promenade. The trees to the south and west are protected from the stronger south westerly winds by buildings and topography, but are somewhat exposed to onshore breezes from the east. The building itself comprises a former theatre complex. The development has one entrance. The author is informed that the area is within a tree conservation area.
Figure 1: Indicative Site Location (outlined in red)
Figure 2: Selected topographical survey

Note: Some areas are marked as “Area unable to Survey”.
2 Limitations/Methodology

The original tree survey which forms the basis of this Arboricultural Impact Assessment was carried out by EcoNorth in May 2017 (BS5837 Tree Survey, EcoNorth 2017).

The trees on site have been surveyed and classified in accordance with British Standard 5837: 2012 ‘Trees In Relation to Construction – Recommendations’ [BS5837]. Trees are large dynamic organisms whose health and condition can change rapidly, therefore due to the changing nature of trees and other site considerations, this report and any recommendations made are only valid for the 12 month period following the site visit on 3rd May 2017.

2.1 Third Party Liability

The limit of EcoNorth Ltd. indemnity over any matter arising out of this report extends only to the instructing Client, namely Willmott Dixon Construction Ltd. EcoNorth Ltd. cannot be held liable for any third party claim that arises following this report. The content and format of this Report are for the exclusive use of the Client. It may not be sold, lent, hired out or divulged to any third party not directly involved in the subject matter without the written permission of EcoNorth Ltd.

2.2 Subsidence Risk

This report is primarily concerned with the condition of existing trees and the application of current guidance for their retention. Any discussion of soil characteristics is only presented where this may have a direct effect on tree growth. This report does not seek to address the specific area of subsidence risk assessment.

2.3 Terminology

This report considers the arboricultural Impacts and Implications of the proposed development. Discussion and comment of Impact relates to the general nature/level of development; whereas Implications refer to specific issues relating to layout and individual trees/groups.

When describing impacts on arboricultural features; reference is made to the following parameters:

a) Positive or negative

b) NJUG: Refers to guidelines to the “Planning, Installation and Maintenance of Utility Services in Proximity to Trees No. 10 (1995)” describing advisable excavations around trees divided into concentric protection zones.
c) **Magnitude**: Refers to the ‘size’ or ‘amount’ of an impact, determined on a quantitative basis where possible.

d) **RPA**: (Root Protection Area) An area calculated in square metres by an arboriculturalist to provide sufficient protection of the tree root system. This will be indicated and provided on a plan.

e) **CEZ**: (Construction Exclusion Zone). Area designated to protect above and below ground tree parts in which no construction or excavation works can take place without express permission of the Arboricultural Officer. This will be indicated and provided on a plan. Fencing of 2.5m height of ‘Herras’ or similar type will surround this area until all works are completed.

f) **Extent**: The area over which the impact occurs (magnitude and extent may be synonymous).

g) **Duration**: The time for which the impact is expected to last prior to recovery or replacement of the resource of feature. Defined in relation to the feature rather than human timeframes. The duration of an activity may differ from the duration of the resulting impact caused by the activity. For example, if short term construction activities cause soil compaction around mature trees, there may be longer term implications for tree health.

h) **Tree retentions and BS5837 categories**:

- Category ‘A’ trees: These are high quality, high amenity trees which should be retained if at all possible. Significant amendments to the development should be considered before removing these trees.
- Category ‘B’ trees: These are reasonably high quality trees whose retention is desirable. Minor amendments to the development should be considered before removing these trees.
- Category ‘C’ trees: These are lower quality trees, the removal of some of these should be considered acceptable, if required to facilitate the development.
- Category ‘U’ trees: Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

i) **Reversibility**: An irreversible (permanent) impact is one from which recovery is not possible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A reversible (temporary) impact is one from which spontaneous recovery is possible or for which effective mitigation is both possible and an enforceable commitment has been made.

j) **Timing and frequency**: Some changes may only cause an impact if they happen to coincide with the critical life stages or seasons (for example, the bird nesting season). This may be avoided by careful scheduling of the relevant activities.
k) **Compensation**: Measures taken to make up for the loss of, or permanent damage to, arboricultural resources through the provision of replacements.

l) **Enhancement**: A new benefit unrelated to any negative impact.

m) **Impact**: The way in which an arboricultural resource is affected by the project.

n) **Mitigation**: Measures taken to avoid or reduce negative impacts.

3. **Site Description**

The site has a mixture of level topography (building, driveway and parking), terracing and slopes in the garden area. It appears to be well drained, although there is clear evidence of recent clearance of severely overgrown ground cover, shrubs and smaller trees. The survey and this report limits itself to the area of the property only and does not consider the effects on trees belonging to neighbours but whose crowns and roots may encroach on neighbouring plots.

4. **Baseline Factors**

The baseline survey data describes the conditions that would pertain in the absence of the proposed demolition.

4.1 **Presence of Tree Preservation Orders [TPO] or Conservation Area [CA] Designation**

Due to the large potential penalties for illegally carrying out work to protected trees, before authorising any tree works a check should be made with the Local Planning Authority to see if the trees are covered by a Tree Preservation Order or if they are within a Conservation Area. The author was informed at the time of the survey that the above restrictions did apply in relation to Conservation Area status. Due to the volume of timber to be removed should the application be successful, then it is likely that a felling licence will also be required, and should be confirmed for removing trees that are not covered by exceptions under amended regulations. The author cannot foresee any exceptions in this instance. If any apply, statutory permission is required before any works can take place.

4.2 **Existing Trees on Site**

The trees were generally in good condition, with a few exceptions noted in the survey report data, but had been pruned back in the past to improve access and provide clearance for pedestrians and vehicles where applicable. The pruning wounds were very evident on some trees and most had occluded successfully from ground level visibility. All of the larger trees – earmarked for removal – were mature native species. Only 1 tree is of
the highest quality or value (category ‘A’) but lies outside the site boundary: a large sycamore *Acer pseudoplatanus* (T004).

Notable arboricultural features and issues on site are as follows:

- **G006** – A group of sycamores that have been cut back to coppice and natural regeneration. These will have to be removed completely to enable developments to proceed.
- **G007** – A group of scrubby shrubs consisting mainly of willow *Salix* sp. and fuchsias *Fuchsia* sp. which will need to be removed completely to enable developments to proceed.
- **T003** – A sycamore of poor form and health, leaning towards the existing building and growing in too close proximity to neighbouring trees should be removed completely rather than pruned back to aid future health and growth of the other trees nearby.
- **T008** – White Poplar *Populus alba*. A good specimen; further investigation of the wall and its roots is recommended if it is to be retained.
- **T011** and **T012** – Sycamores that are good specimens; further investigation of the wall and the trees’ roots is recommended if it is to be retained.
- **T004** – Large mature sycamore in good health and with good form. Localised pruning of eastern branches to facilitate scaffolding should be carried out to the minimum amount. The Root Protection Area (RPA) of this tree encroaches to some extent into the site. As this area is all hard landscaping surfaces, it is unlikely that root development will be as extensive in this area of the RPA, however care should still be taken with below ground excavations in this zone.

### 4.3 Root Protection Areas (RPAs)

The RPAs have been calculated in accordance with BS5837, and are detailed on the Tree Survey Plan (see Appendix 4 of the BS5837 Tree Survey Report, EcoNorth 2017). Where ground constraints have had, or are likely to have, an effect on tree root development, for example, where level changes or changes in rooting medium (heavily compacted ground) have influenced tree root growth, the RPA has been adjusted accordingly and are detailed in Table 1.
Table 1 - Modified RPAs

<table>
<thead>
<tr>
<th>Tree / Group Ref. No.</th>
<th>Reasons for Modifying RPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>T004</td>
<td>A small percentage (&lt; 20% or more) of the tree’s RPA may be affected by the need for construction work or surface works. Few of the water seeking roots will be in this area as it is not a good area for the growth of tree roots. The ground level should remain the same according to the latest development plan, but surface materials may be changed/replaced. It is advisable that mechanical excavation is kept to a minimum and any exposed roots are avoided and protected. Materials and spoil should not be stored in this area. Work should aim to minimise root damage.</td>
</tr>
<tr>
<td>T008, T010, T011</td>
<td>Each of these trees may be affected by work to the embankment - if they are to be retained - although the extent of these trees’ roots is difficult to ascertain due to the topography and lack of accurate diameter measurement in the survey. It is unlikely that the roots will be extensive or even present in the area at the base of the embankment. If so, a large percentage (c. 20% or more) of the tree’s RPA may be affected by the need for construction if the RPA is assumed to be a perfect circle, which is highly unlikely. It is advisable that mechanical excavation is kept to a minimum in the RPA in the car park area and any exposed roots are avoided and protected. Materials and spoil should not be stored in this area. Work should aim to minimise root damage. If possible a cellular confinement system should be installed in this area.</td>
</tr>
</tbody>
</table>

5. Implications Assessment

5.1 Above Ground Constraints

Effects of Repairs and Construction on Amenity Value on or Near the Site

Many of the existing trees located along the upper car park boundary will be lost, which will affect the appearance of the site to a considerable extent. None of the trees on the car park boundary are of the highest ‘A’ category, but collectively screen the site; the trees therefore offer good amenity value. It is recommended that replacement planting takes place on the site to mitigate their loss.
Pruning and Felling Works to Facilitate Development

The proposed works will entail the removal and protection of several trees, as indicated in the survey recommendations. A surface to prevent compaction should be installed on the RPAs of retained trees, if the use of plant and contractors is necessary.

Where removal is to take place, suitable fencing as described in the method statement should be installed to protect remaining trees, and to mark the areas to be left. This may not be practical in some areas due to the dense growth and may need to be installed after the felling has taken place.

Pruning of some remaining trees’ branches will be necessary as they will encroach near to the elevations during development work and hinder safe working at height from scaffolding.

Proximity of Trees to Structures

Only 1 tree surveyed has its RPA that reaches the current buildings as it stands. However, it is likely that some roots from other trees do so, but do not form a constraint to demolition.

5.2 Below Ground Constraints

Proximity of Trees to Structures

Details of below ground services were not available and could change closer to the demolition date. These would have to be considered before demolition and re-development of the site takes place, but are unlikely to be affected by the trees surveyed at this time.

Works Required Within the RPA

The demolition will occur within the RPA of trees as shown on the survey tree constraints plan (Figure 3). The work will only involve a small proportion of the RPA (< 20% for T004). T008, T011 and T012 may also be affected by the movement of people and plant during the demolition phase if they are to be retained. If work is unavoidable in these zones then NJUG should be followed to prevent damage to a large proportion of the tree roots of affected trees.

Ground Level Changes

Ground level changes will not be significant enough to impact on retained trees. Any ground level changes not indicated on the plan should occur outside the RPAs.
6. Construction Processes of the Proposed Development

Development processes that lead to soil compaction in tree rooting zones and physical damage to trees can adversely affect long-term tree health. This can lead to unnecessary tree loss if not controlled properly on site during the building and the construction phases.

6.1 Tree Protection

No access to the RPA of any retained tree will be permitted before or during demolition activity, unless detailed in an Arboricultural Method Statement or otherwise agreed in advance with the LPA following advice from the appointed specialist.

The processes of construction are highly unlikely to have a detrimental effect upon the health of the retained trees assuming recommendations made in this report are adhered to at all times by the contractors e.g. the positioning of a stout fence between the retained trees and construction activities is placed prior to commencement of works and remains intact and in position throughout the duration of the construction activities.

BS5837 recommends that retained trees (and areas suitable for new planting) are incorporated into Construction Exclusion Zones (CEZs) and suitably protected throughout the development process. The CEZs are clearly marked on the Tree Protection Plan, modified by EcoNorth Ltd, which accompanies this report (see Appendix A).

The development will be carried out in the following order:

1. Remedial tree works undertaken
2. Tree Protection Fence installed
3. Development of site
4. Removal of Tree Protection Fence

7. Modifications Proposed to Accommodate Trees

The positioning of temporary surfaces dispenses with a need to modify them to accommodate retained trees. The need for subsequent calls for tree pruning due to track or vehicle interference will need to be assessed at a later date. The layout was proposed prior to the Tree Constraints Plan.
8. **Infrastructure Requirements – Highway Visibility, Lighting, CCTV, Services, etc.**

The installation of services within the rooting zones of trees can have a large detrimental impact on the long-term survival of retained trees leading to their unnecessary loss or root failure in high winds. No services are to be installed within any remaining tree’s RPA at present.

Vehicular entrance from the main entrance will be used to gain access to the site initially. Any enhancement of the driveway by digging down could have a significant impact upon tree health causing die back and subsequent requests for removal. It should be possible to avoid a change to the RPAs of the large sycamore (T004) in the park through sensitive surface works. The trees on site do not have any impact on highway visibility at present and there is evidence of previous limb removal on some trees bordering all roads.

Undisclosed locating of above ground services, CCTV cameras, electrical sub-stations, refuse stores, lighting and other infrastructure requirements can lead to unnecessary pruning of tree crowns or root loss during or post development. It is not known whether such developments are planned to take place adjacent or within the RPA of any retained trees.

Underground services near to trees will need to be installed in accordance with the guidance given in BS5837 together with the National Joint Utilities Group (NJUG) publication Volume 4 ‘Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees’ - 2007.

9. **Mitigating Tree Loss/New Planting**

Some trees would be lost as a result of the development of the construction works, therefore a landscape plan may be drawn up if this is considered necessary. This should incorporate management of the existing vegetation and new planting of trees sympathetic to the environment and to the benefit of the new development and the surrounding landscape.

Where new tree planting is planned, it is imperative that consideration is given to future management and maintenance.

10. **Impact Assessment**

The proposed works will have some arboricultural effects on the site as a whole. In the context of sustainability, the information clearly shows that the impact on significant trees has been considered through the design process. The balancing out of the concerns and needs of the owner, the safety of the highway and the amenity value to the public in the neighbourhood means that some temporary and very visible losses are inevitable. The
level of mitigation recommended is appropriate to ensure the site is affected in as sensitive a manner as possible in the circumstances. In the long term, the effects on trees will be significant but easily mitigated with future new planting and renewal.

The arboricultural aspects of the development to be measured/assessed is in line with Department for Communities and Local Government (DCLG) Planning Policy, for example:

**PPS 1 – Protection and Enhancement of the Environment** - “Planning should seek to maintain and improve the local environment and help to mitigate the effects of declining environmental quality” and “to protect and enhance the quality, character and amenity value of the countryside and urban areas as a whole.”

**PPS 9 – Key Principles** - “development should take a strategic approach to the conservation, enhancement and restoration of biodiversity and geology, and recognise the contributions that sites, areas and features, both individually and in combination, make to conserving these resources.”

**PPS 3 – When Assessing Design Quality** - “the extent to which the proposed development...provides for the retention or re-establishment of the biodiversity within residential environments.”

The retained trees may require some minor pruning over the 10-20 years following completion of the development but the level of pruning is likely to be minor with a low impact on the trees health and amenity value.

### 11. Post-Development Pressure

The level of tree management required will be low and similar to that required as part of the normal management of the garden, regardless of the proposed development.

In consideration of these matters, there will be no appreciable post-development pressure, and none that would oblige the Council to give consent to inappropriate tree works.

### 12. Conclusions

The layout of the proposed work was unavailable prior to the production of a Tree Constraints Plan. Some constraints were therefore estimated, but the plan should be readily adapted to the requirements of the proposed work.

The work will entail the removal of several trees and other undergrowth. The loss of this vegetation can be mitigated with new planting and/or management of the screening vegetation.

The proposals are acceptable, provided correct methods are employed and especially if replacement measures are carried out when practicable.
13. Recommendations

It is strongly recommended that the arboricultural protection measures are clearly communicated to the entire construction team prior to commencement – this process should involve the Local Planning Authority so as to ensure any planning conditions are not breached. This is most effectively managed by monitoring the development on a regular basis, checking tree protection measures in relation to the Tree Protection Plan & Arboricultural Method Statement(s) and reporting to the LPA on a monthly basis.

All tree work should be undertaken by trained and competent personnel to current industry standards and guidance.

Please note: The statements made in this Report do not take account of extremes of climate, vandalism or accident, whether physical, chemical or fire. EcoNorth Ltd. cannot therefore accept any liability in connection with these factors, nor where prescribed work is not carried out in a correct and professional manner in accordance with current good practice. The authority of this Report ceases at any stated time limit within it, or if none stated after two years from the date of the survey or when any site conditions change, or pruning or other works unspecified in the Report are carried out to, or affecting, the Subject Tree(s), whichever is sooner.

14. References


Mapping provided by © Crown copyright and database rights 2017 Ordnance Survey 100048957.
Appendix A – Tree Protection Plan

Tree Protection Plan (Construction Exclusion Zones marked as orange solid line).

Scale 1:200 Tree Protection Plan. Futurist Theatre, Scarborough
Appendix B – Outline Method Statement

1 Method Statement for Tree Protection Throughout the Development & Construction Period

The following Outline Arboricultural Method Statement (AMS) refers to the Tree Protection Plan (TPP) above prepared by EcoNorth Ltd. to identify:

- Trees to be retained
- Construction Exclusion Zones (CEZ)
- Measurements to identify CEZ in relation to centres of trees

Construction Exclusion Zone

The Construction Exclusion Zone (CEZ) required by the current edition (2012) BS5837 Trees in Relation to Construction relates to the stem diameter of each tree when measured at a height of 1.5 m from ground level, adjusted where necessary to account for actual rooting patterns on site. The CEZs are to be afforded protection at all times and will be protected by robust fencing. No works should be undertaken within any CEZ that causes unnecessary compaction to the soil or severance of tree roots.

There are construction operations planned within the CEZs to extend parking.

The construction measures within the CEZ will be controlled by the method statement in Section 3 and following details supplied to, and approved by, the Local Planning Authority.

Protective Fences

A protective fence will be erected 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 barrier will have signs attached to it stating that this is a Construction Exclusion Zone and that no works are permitted within the barrier. The barrier may only be removed following completion of all construction works.

The fence is required to be sited in accordance with the Tree Protection Plan enclosed with this method statement as Appendix A. The fence must ideally be constructed as per Figure A1 in BS5837: 2012 and be fit for the purpose of excluding any construction activity (see Appendix 1.2 of British Standard documentation). The level of construction on site would be suitably excluded from the CEZ with any barrier type construction, coupled with the designated site manager to formally brief any construction personnel with regard to the contents of this method statement.

There are no new accessible areas of planting to be protected during the construction phase.

No access to the site from any other part of the property than the existing entrance will be permitted for construction traffic or delivery of supplies.
Precautions in Respect of Temporary Works

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 such as concrete slabs or geo-textile fabrics 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 laid onto a geotextile fabric may be acceptable.

Temporary access into RPAs of T004, T008, T011 and T012 will be required on this site, but should be kept to a minimum (see Tree Constraints Plan).

Access Details

There is no requirement for any special measures related to the retained trees as all access for construction vehicles will be from the existing access drives, outside of the CEZ.

Contractors Car Parking

Within the existing hard standing area.

Storage Space

The storage space has been allocated within any existing compound area.

Additional Precautions

There are no services planned to be installed within a CEZ at present.

No storage of materials, lighting of fires will take place within the CEZ. No mixing or storage of materials will take place up a slope where they may leak into a CEZ.

No fires will be lit within 20 metres of any tree stem and will take into account fire size and wind direction, so that no flames come within 5 m of any foliage.

If there is a requirement to use cranes or high sided vehicles during the construction process then a method statement will be supplied, and approved by the LPA, to ensure that there is no damage to the retained trees.

No notice boards, cables or other services will be attached to any tree.

Materials which may contaminate the soil will not be discharged within 10m of any tree stem. When undertaking the mixing of materials it is essential that any slope of the ground does not allow contaminates to run towards a tree root area.

Site Gradients

No alterations of soil levels will take place within the CEZ of the protected trees.

Demolition

The surface of part of the drive and will be demolished. This may affect the RPAs of the remaining trees.
Hard Surfaces
Some hard surfaces are to be constructed within the CEZ, but guidance should be followed to minimise damage.

Soft Landscaping
Soft landscaping is scheduled to be carried out in parts of the CEZ. It is recommended that replacement planting take place upon completion of all construction work. If this is adopted then details will be supplied to and agreed by the LPA prior to the commencement of works.

Use of Herbicides
Herbicide use may be required on this site.

On Site Monitoring Regime
The tree protection measures shall be monitored by the appointed specialist who will meet with the contractor and site manager prior to the commencement of development to explain the tree protection requirements and emergency procedures. The appointed specialist shall submit a monthly monitoring log to the LPA, the site manager, and to the client.

The contractor / site manager shall contact the appointed specialist if any breaches of the CEZ and tree protection measures occur. The appointed specialist shall recommend an action plan to incorporate mitigation measures where necessary.

Use of Subcontractors
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.

Contingency Plan
Water is 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 an arboriculturalist for advice.

Remedial Tree Works
Tree works (see schedule at Section 2 – Tree Work Schedule) will be undertaken prior to the commencement of works. All tree works are to be carried out in accordance with BS 3998 Recommendations for Tree Works 2010.

Responsibilities
It will be 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 regard 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 BS 3998 Recommendations for Tree Works 2010.

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.

**Figure A1 - Example Specification Tree Protection Fence**

See Tree Protection Plan
2 Tree Work Schedule

The following tree works are required to allow construction to commence and to address safety concerns. The order of works may be modified depending on the method statement for the redevelopment works:

<table>
<thead>
<tr>
<th>Tree No.</th>
<th>Works</th>
</tr>
</thead>
<tbody>
<tr>
<td>T003</td>
<td>Remove tree</td>
</tr>
<tr>
<td>T001</td>
<td>Minor branch pruning for scaffolding access only</td>
</tr>
<tr>
<td>T002</td>
<td>Minor branch pruning for scaffolding access only</td>
</tr>
<tr>
<td>T004</td>
<td>Minor eastern growing branch pruning for scaffolding access only</td>
</tr>
<tr>
<td>G006 and G007</td>
<td>Remove all shrubs and trees in the area indicated</td>
</tr>
<tr>
<td>T005</td>
<td>Remove single tree and surrounding vegetation</td>
</tr>
<tr>
<td>T009 and T010</td>
<td>Remove trees</td>
</tr>
<tr>
<td>T008, T011 and T012</td>
<td>Investigate tree roots integrity and wall. Remove trees if appropriate or more practicable</td>
</tr>
</tbody>
</table>

Control measures:

- All tree removals and pruning to be approved by LPA if TPO/CA constraints apply.
- All tree removals to take place following approval for a felling licence.
- All tree works to be in accordance with the British Standard for Recommendations for Tree Works, BS3998: 2010 and the European Tree Pruning Guide (ISA).
- Although no evidence of the presence of Phytophthora ramorum on the site, tree contractors should still take precautionary measures (use of disinfectants on felling and pruning tools).
- The general tree protection measures shall apply to the tree surgery teams.
- All contractor vehicles to be parked and stored outside the CEZ.
- No re-fuelling of machinery to take place within the CEZ and not within 10m of the CEZ or uphill of it.
3 Arboricultural Method Statement – installation of hard landscaping at the edge of the RPAs

Any permanent construction work or temporary vehicle or plant parking will encroach on the inside the edge of the Root Protection Areas of some retained trees. Care will need to be taken to avoid damage to the roots of these trees due to compaction, storage of materials and possible root destruction. The method statement sets out the principles of tree protection that need to be followed. This is an outline to demonstrate that the proposal is possible without causing unnecessary damage to the tree. To protect the existing tree roots the installation should be as follows:

- The tree protective fencing will be erected prior to any works commencing on site
- The line of the final cut for the hard surface will be marked on the ground.
- Excavation should be minimized in the RPA.
- The ground will be excavated with a digger located outside the CEZ
- Any exposed roots present in the excavation will be pruned using hand tools when possible e.g. sharp pruning saw or secateurs leaving as small a diameter cut as possible
- A geotextile membrane should be placed to maintain a separation of layers and on top of this, open a cellular panel.
- Into this panel pour angular stone, without fine stones and soil to retain gaps for water and air movement.
- The stones are filled to overflowing and compacted into it.
- Another geotextile membrane prevents sand above from dropping into the voids between the stones.
- Surfacing of tarmac, paviours or gravel can be added above the sand-binding layer as a wearing course.
- The operation will be supervised by the appointed specialist

Arboricultural Method Statement – Installation of Footways Within the Root Protection Area

No footways are proposed within the root protection areas at this time. If the plan changes subsequently then the following methodology is to be applied:

1) Remove existing vegetation from the surface, taking care to limit the use of mechanical plant where practical.
2) Undertake pruning works if required.
3) Existing surface and topsoil is to be retained. No excavations or trenching for the installation of services in footpath area.
4) Any voids or depressions within the ground surface are to be filled with sharp sand (not builders sand) to maintain levels.

5) Install geotextile separation filtration layer over area for footways.

6) Install cellular confinement mats over the area. Expand the Cellweb panels to the full length. Trim to desired width. Pin the Cellweb panels with staking pins to anchor open the cells and staple adjacent panels together to create a continuous mattress.

7) Install treated timber boarding of approximately 150mm height for lateral support secured by robust stakes for both sides.

8) Infill the Cellweb with a no fines angular granular fill of size 40-20mm within each open cell.

9) Install second layer of geotextile separation filtration layer.

10) Apply finished surface of gravel.

4 References