

Arboricultural Impact Assessment

Relating to development proposal at
Staverton Hydropower Project

Client:
Staverton Hydro

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1 Summary

This report considers the direct and indirect effects of the proposed development in relation to the existing trees; evaluates the magnitude and significance of arboricultural impacts and makes recommendations for control measures applicable throughout the construction stages of the project.

KEY trees have been identified for retention

A baseline site survey of the existing trees established key arboricultural constraints to development. All existing trees over 300mm diameter are to be retained. The trees currently present a range of benefits to the wider landscape.

The woodland will benefit from good management

The project gives an opportunity to pro-actively manage areas of the important woodland to the south of the River and replace invasive regen with native trees

The overall arboricultural impacts are minor and reversible

There will be some minor soil disturbance caused because of the construction. However, impacts on existing trees can be remediated with new planting along the disturbed cable route.

There will be active monitoring and careful construction controls in place during the works.

Arboricultural Impact Assessment Report

Staverton Hydropower Project

2 Introduction

Instruction

- 2.1 I have been instructed by Staverton Hydro (Client) to provide an arboricultural impact assessment, professional opinion and advice in relation to the proposed development.
- 2.2 This report includes evaluation of the direct and indirect effects of the proposed project and the resulting impacts on trees and local amenity.

Scope

- 2.3 Details of the report author, a general disclaimer and the limitations of this report are included as *Appendix 1*.

3 Baseline information

Brief project overview

- 3.1 The general layout and juxtaposition of the existing site features are shown on the following plan extract/image.

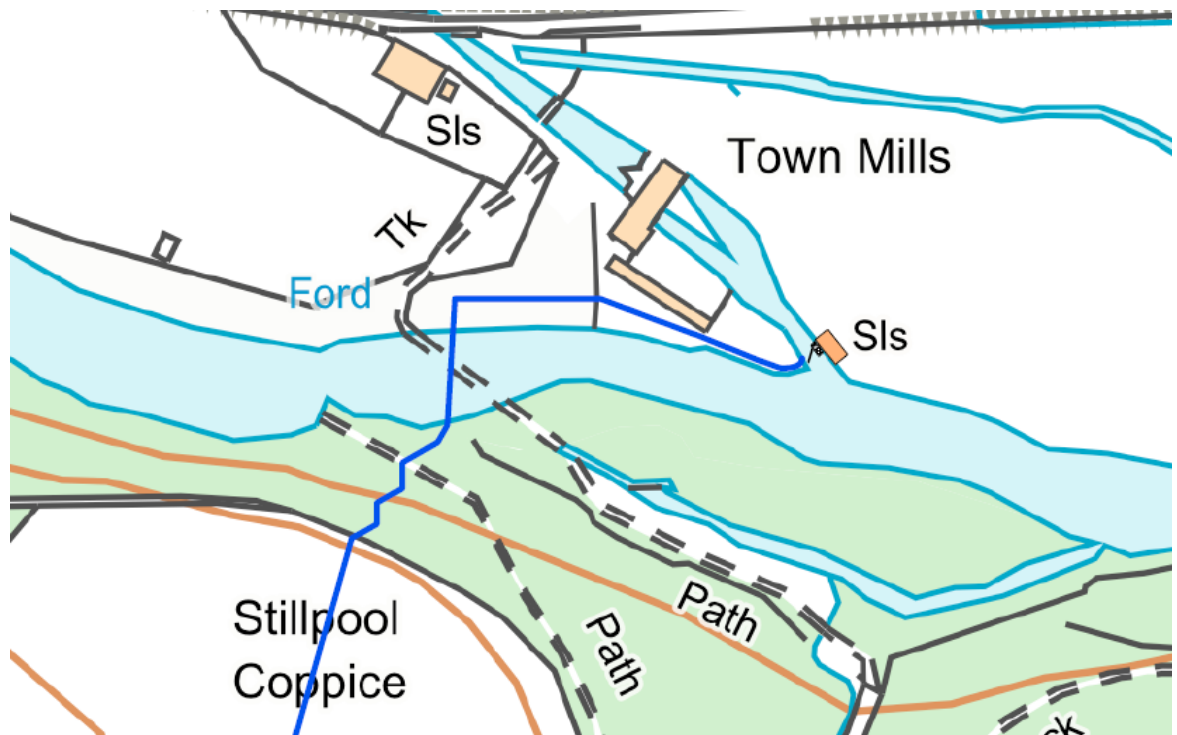


Image 1: Assessed route area

Key trees & features

- 3.2 The area assessed comprises a garden area to the north of the River and woodland to the southern side of the River.
- 3.3 There are several amenity trees in the garden of Town Mills.
- 3.4 The steep woodland to the south is a key feature.

4 Proposed Development

- 4.1 The project area I assessed requires a trench to be excavated and a cable routed as shown by the Blue line on *image-1*.
- 4.2 The trench is required to be approximately 1m deep and 300mm wide.
- 4.3 The trench will be excavated with a machine where possible/appropriate. The excavator will be 2m wide and approximately 5 tons.

5 Arboricultural Impact Assessment

Terms & Definitions

- 5.1 When describing impacts on arboricultural features; reference is made to the following parameters, as appropriate or relevant to the specific issue:
 1. **Positive or negative**
 2. **Magnitude:** Refers to the 'size' or 'amount' of an impact, determined on a quantitative basis where possible.
 3. **Duration:** The time for which the impact is expected to last prior to recovery or replacement of the resource or feature, (defined in relation to the feature - rather than human time frames). 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.
 4. **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.
 5. **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.
 6. **Compensation:** Measures taken to make up for the loss of, or permanent damage to, arboricultural resources through the provision of replacements.
 7. **Enhancement:** A new benefit - unrelated to any negative impact.
 8. **Impact:** The way in which an arboricultural resource is affected by the project.
 9. **Mitigation:** Measures taken to avoid or reduce negative impacts.

Tree Removal & Retention

- 5.3 All trees which make a positive contribution to the area have been retained wherever possible.
- 5.4 The only trees identified for removal will be small (understorey) self-sown trees in the woodland area.

Impact of proposed development on amenity value

- 5.5 Generally, there will be a short term temporary negative impact due to the removal of small trees required to install the trench and cable. This impact is to be limited by the planting and establishment of replacement trees wherever practicable so that the mid to long-term impact is neutral-positive.
- 5.6 The project gives an opportunity to pro-actively manage areas of the important woodland to the south of the River and replace invasive regen with native trees.

Retained trees - General minor impacts

- 5.7 There are a number of impacts of no discernible significance which are not discussed in detail in this report. These relatively minor issues are adequately mitigated through standard clause recommendations for construction stage tree protection measures, as indicated on the accompanying TPP.
- 5.8 There are 2x mature trees adjacent to the route which will need considered working measures and management to reduce impacts.
- 5.9 One mature tree is to the north of the river and is a large Ash. The route passes within the RPA. In this case the trench will be carefully excavated (in accordance with NJUG-4).
- 5.10 In the woodland area there is a large oak tree near the route. Again, the trench is within the RPA. In this instance the trench will be progressively dug with the excavator and monitored. If large structural roots are encountered they will be avoided. Small roots will be pruned.

6 Trees & Planning Policy

- 6.1 Trees are a material consideration throughout the planning process and therefore the arboricultural information presented in this report and accompanying plans has been aligned with the objectives of the National Planning Policy Framework (NPPF) and the general tree-related policies and development objectives of the Local Planning Authority (LPA). See details in the appendices.

7 Conclusions

- 7.1 The trench can be installed along the route shown with minor disturbance to the woodland and retained trees.
- 7.2 Careful site-specific working methods will need to be agreed and actively monitored throughout the construction stage.

- 7.3 The overall arboricultural impact can be limited in the short-term, mitigated during the works, and positively compensated for in the long-term with new tree planting.

8 Recommendations

- 8.1 The tree protection measures discussed in this report should be implemented.
- 8.2 The appropriate use of well worded planning condition(s) are considered a key element of successful tree retention during development and construction.
- 8.3 It is important that the tree protection measures are clearly communicated to, and understood by, the entire construction team prior to commencement of any site works – 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 a detailed Tree Protection Plan & Arboricultural Method Statement(s) and reporting to the LPA on a monthly basis.
- 8.4 It is recommended that development is carried out in the following order:
- a) Detailed TPP & AMS agreed with LPA.
 - b) Tree protection measures installed.
 - c) Initial site clearance ground works. Works monitored for compliance.
 - d) Removal of tree protection measures.
 - e) New tree planting to compensate and improve route area.
- 8.5 All items above to be undertaken in accordance with LPA approved arboricultural method statements.

Appendices:

A1 Appendix 1 - Disclaimer, Limitations & Author

A2 Appendix 2 - Relevant Planning Policy (details)

A3 Appendix 3 - Default Tree Protection Measures

A4 Appendix 4 - AMS heads of terms

A1.1 Disclaimer

The statements made in this Report do not take account of extremes of climate, vandalism or accident, whether physical, chemical or fire. Aspect Tree Consultancy 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.

A1.2 Limitations

The survey and report are concerned with the arboricultural aspects of the site only. This report is primarily concerned with the condition of existing trees and the application of current guidance for their retention.

No documented information has been provided regarding any site-specific history of ground disturbance, root damage or severance, changes in soil levels, previous utility installations or any changes in site conditions.

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 survey.

Subsidence Risk Assessment: 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.

Foundation Design: The design and construction of foundations should be informed by appropriate soil sampling and laboratory testing in accordance with NHBC Chapter 4.2. This report does not specifically relate to risks associated with subsidence, heave or other forms of disturbance associated with tree root growth or tree removal.

Third Party Liability: The limit of Aspect Tree Consultancy indemnity over any matter arising out of this report extends only to the instructing Client. Aspect Tree Consultancy 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 Aspect Tree Consultancy Ltd.

A1.3 Author

D Scanlon

MICFor, F.Arbor.A, CEnv

I am a professional tree specialist and Institute of Chartered Foresters Registered Consultant. I am a Fellow Member of the Arboricultural Association, Chartered Arboriculturist and Chartered Environmentalist.

I have skills and experience directly relating to the management of trees through the planning, development and construction processes such that I am a suitably qualified and experienced competent person as defined by **BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations [BS5837]**.

A2.1 National Planning Policy Framework NPPF

Paragraph 11. Plans and decisions should apply a presumption in favour of sustainable development.

15. Conserving and enhancing the natural environment

Paragraph 170 (relevant parts only). Planning policies and decisions should contribute to and enhance the natural and local environment by:

- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
- d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

Habitats and biodiversity:

175. When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- c) development resulting in the loss or deterioration of irreplaceable habitats (**such as ancient woodland and ancient or veteran trees**) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged,

especially where this can secure measurable net gains for biodiversity.

A2.2 LPA Planning Policy

Plymouth & South West Devon Joint Local Plan 2014-2034

Policy DEV28 - Protecting and enhancing biodiversity and geological conservation

Development should support the conservation, enhancement and restoration of biodiversity and geodiversity across the Plan Area. Specific provisions are identified below:

1. Full account will be given in making planning decisions to the importance of any affected habitats and features, taking account of the hierarchy of protected sites:
 - i. Internationally important sites including existing, candidate or proposed Special Protection Areas and Special Areas of Conservation.
 - ii. Nationally important sites including Sites of Special Scientific Interest, National Nature Reserves, Ancient Woodlands and Marine Conservation Zones.
 - iii. Locally important sites including County Wildlife Sites, Local Nature Reserves, Regionally Important Geological Sites, and other priority habitats.
 - iv. The ecological network of wildlife corridors and stepping stones that link the biodiversity areas detailed above, including areas identified for habitat restoration and creation.
2. Net gains in biodiversity will be sought from all major development proposals through the promotion, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of legally protected and priority species populations. Delivery of net gains in biodiversity should be designed to support the delivery of the identified biodiversity network that crosses the Plan Area and links the city of Plymouth to the countryside and coast, as well as the network within the city itself. The level of biodiversity net gain required will be proportionate to the type, scale and impact of development. Enhancements for wildlife within the built environment will be sought where appropriate from all scales of development.
3. Development which would be likely to directly or indirectly impact the biodiversity value of a site will not be permitted unless:
 - i. The need for and the public interest benefits of the development outweigh the harm, including any harm to the integrity of the ecological network.
 - ii. The impacts cannot be avoided through an alternative, less harmful location, design or form of development.

- iii. The development demonstrates that it has proactively tried to avoid impacts on biodiversity and geological interests through the design process prior to developing measures to mitigate or as a last resort to compensate for unavoidable impacts.
- iv. The favourable conservation status of legally protected species is maintained.
- v. Impacts upon species, habitats or geodiversity can be reduced to a level whereby they are not significant by appropriate mitigation or as a last resort, by compensation.
- vi. Potentially adverse effects can be fully mitigated and / or compensated in the case of European Protected Sites.

4. Development will provide for the long term management of biodiversity features retained and enhanced within the site or for those features created off site to compensate for development impacts.

Policy DEV30 - Trees, woodlands and hedgerows

Development that would result in the loss or deterioration of the quality of:

- Ancient woodland, aged or veteran trees or impact on their immediate surroundings;
- Other woodlands or high amenity trees including protected trees;
- Important hedgerows including Devon hedgebanks; will not be permitted unless the need for, and benefits of, the development in that location clearly outweigh the loss and this can be demonstrated.

Development should be designed so as to avoid the loss or deterioration of woodlands, trees or hedgerows. If the loss of trees, woodlands or hedgerows, cannot be avoided, new native and locally appropriate trees and hedgerows will be secured as mitigation to ensure they contribute to a 'net gain'. Mitigation should be delivered on site, but if this is not achievable, offsite compensation will be required to provide a net gain in canopy cover in line with local standards.

South Hams LDF Core Strategy

Adopted Dec 2008

Policy CS10 – Nature Conservation

Habitats and features of regional and local importance for nature conservation will be protected and , where possible, enhanced through beneficial management.

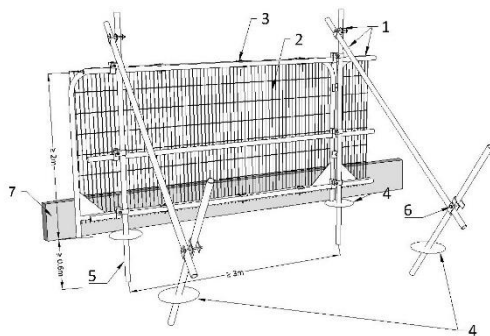
DP5: Biodiversity and Geological Conservation

Development likely to have an adverse effect on the nature conservation or geological interest within Strategic Nature Areas, National Nature Reserves, County Wildlife Sites, County Geological Sites, Ancient Woodland or sites/features identified as having similar substantive interest, including veteran trees, will not be permitted, unless benefits of the development clearly outweigh the identified biodiversity or geological value of the site/feature.

A3.1 Tree Protection Measures

Retained trees should be protected by barriers and/or ground protection before any materials are brought onto site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a Construction Exclusion Zone (CEZ). Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection should be installed.

A3.2 Default Tree Protective Fence (TPF) – Type1:

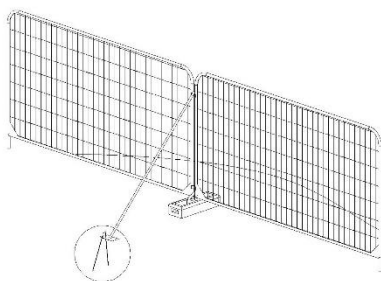


Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6m)
- 6 Standard scaffold clamps
- 7 Toe board 600mm to prevent soil running through fence (In timber or fabric)

A3.3 Default TPF – Type2a:

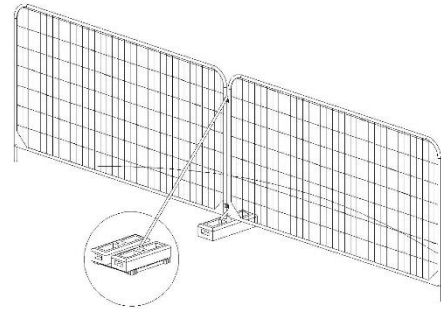
Examples of above-ground stabilizing systems



a) Stabilizer strut with base plate secured with ground pins

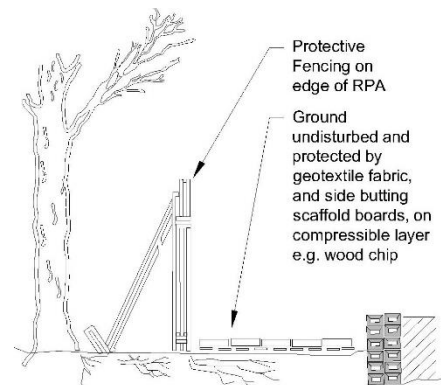
A3.4 Default TPF – Type2b:

Examples of above-ground stabilizing systems

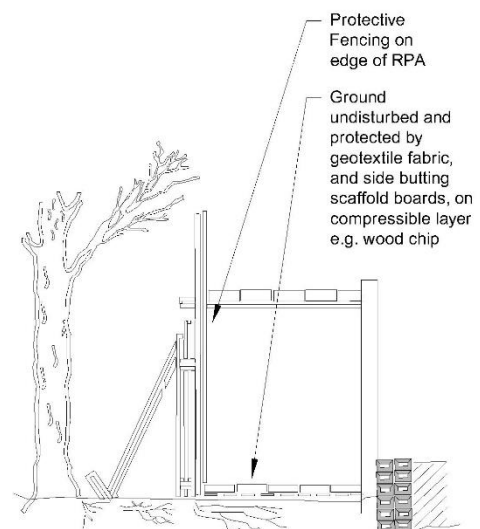


b) Stabilizer strut mounted on block tray

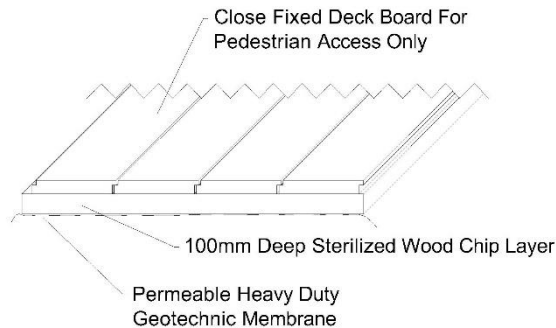
A3.4 TPF + Ground Protection in RPA:



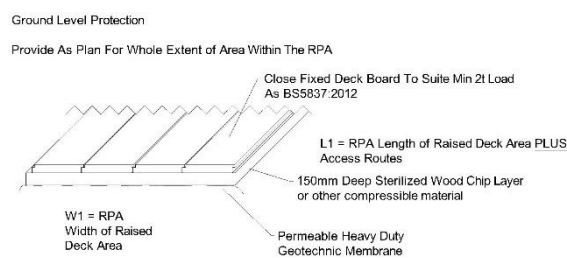
A3.5 TPF + Scaffolding in RPA:



A3.6 Ground Protection in RPA – pedestrian:



A3.6 Ground Protection in RPA – up to 2 ton:



A3.7 Example Warning Sign for TPF:



The final construction stage **Tree Protection Plan** shall be accompanied by a detailed **Arboricultural Method Statement** which will include details necessary to ensure the protection of trees throughout the demolition and construction stages of the proposed development.

A3.8 Tree Protection Plan (TPP)

The final TPP shall include details covering the following site-specific items:

- 1) Site Construction Access.
- 2) All hard surfacing within RPAs.
- 3) Construction Exclusion Zones.
- 4) Precise location of TREE PROTECTION FENCING - dimensioned – including temporary fencing & set back positions.
- 5) Barriers & Ground protection details – dimensioned.
- 6) Special protection measures (see AMS A4.2)
- 7) Location of utilities routes.
- 8) Areas for drainage / attenuation.
- 9) Working space for cranes, plant, scaffolding and access during works.
- 10) Position of site huts & welfare facilities.
- 11) Contractor car-parking.
- 12) Materials storage areas.
- 13) Build sequence/phasing of construction works.

A3.9 Arboricultural Method Statement (AMS)

The final AMS will be prepared and agreed with the LPA prior to start. The AMS may cover the following:

- 1) Pre-start Meeting.
- 2) Contact details for key personnel.
- 3) Site Monitoring Schedule.
- 4) Detailed Tree Work Schedule & Pruning Specification.
- 5) Final details of all operations within RPAs.
- 6) Utilities: methods of installation near trees.
- 7) Emergency Procedures.

A4.1 General / Standard AMS information

Pre-commencement site meeting: Prior to the commencement of the development, site clearance or ground-works a site meeting shall be arranged and held between the Site Manager, the Arboriculturist, and the Tree Protective Fence contractor.

Any defective tree protection measures will be reported to the site manager immediately and made good in the same day.

The site manager is responsible for informing the LPA or an appointed arboricultural specialist of any damage to or breaches of the Tree Protection Measures immediately.

Construction Exclusion Zone – CEZ: The CEZs are to be afforded protection at all times and will be protected by robust FENCING and/or GROUND PROTECTION as detailed. No works will be undertaken within any CEZ that causes compaction to the soil or severance of tree roots.

Tree Protective Fences (TPF): Protective fencing will be erected in accordance with the TPP prior to the commencement of any site works i.e. before any materials or heavy machinery is brought on site. The fencing may only be removed following completion of all construction works or with the formal agreement of the LPA. The location of the TPF will be as accurate as possible to the approved TPP. Any change to the position or construction of the fencing must be approved by the Arboriculturist and subsequently agreed by the LPA. No vehicles will drive or be parked within the CEZ. No materials will be stored within the CEZ.

Warning Notices will be affixed to every third panel or at 12m centres and will be made of all-weather signs.

After installation of the TPF the CEZ must be considered sacrosanct and off limits for any access or construction activity without the formal consent of the LPA or otherwise detailed on the TPP.

On-site environmental good practice guidelines:

Storage and use of Liquids and Hazardous Materials.

Liquids (fuel etc.) should be stored as far away from CEZ areas as is reasonably practicable. Spill kits and drip trays should be provided and maintained in close proximity to where liquids are stored, dispensed and used. Materials should be stored in accordance with manufacturer's Safety Data Sheets.

Drip trays or absorbent mats should be placed under filling points during the transfer/dispensing of liquids e.g. during the refuelling of plant to avoid any form of soil contamination in or immediately adjacent to CEZs or area for new landscape planting.

Responsibilities:

It is the responsibility of the Building Contract Manager (TBC) to ensure that the planning conditions attached to planning consent are adhered to at all times.

The Building Contract Manager will be responsible for contacting the LPA 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 2010.

The Building Contract Manager 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.

Emergency Departures & Incident Reporting:

The contractor shall contact an appointed arboricultural specialist or the LPA Tree Officer if any breaches of the CEZ and tree protection measures occur.

An action plan to incorporate mitigation measures where necessary will be agreed and effectively implemented.

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 the arboriculturist for advice.

Arboricultural Site Monitoring: Monitoring will be undertaken at a frequency agreed with the construction site manager during the initial pre-commencement site meeting.

The arboriculturist shall be present during the following

Key Stages:

- 1) Pre-start meeting & initial positioning of the TPF & ground protection measures.
- 2) Minimum bi-monthly monitoring visit by specialist.
- 3) All operations near trees (as detailed in AMS) are supervised.

A4.2 Detailed specific AMS required

Where the accompanying TPP shows specific AMS areas outline details covering the identified issues are included on the plan.

