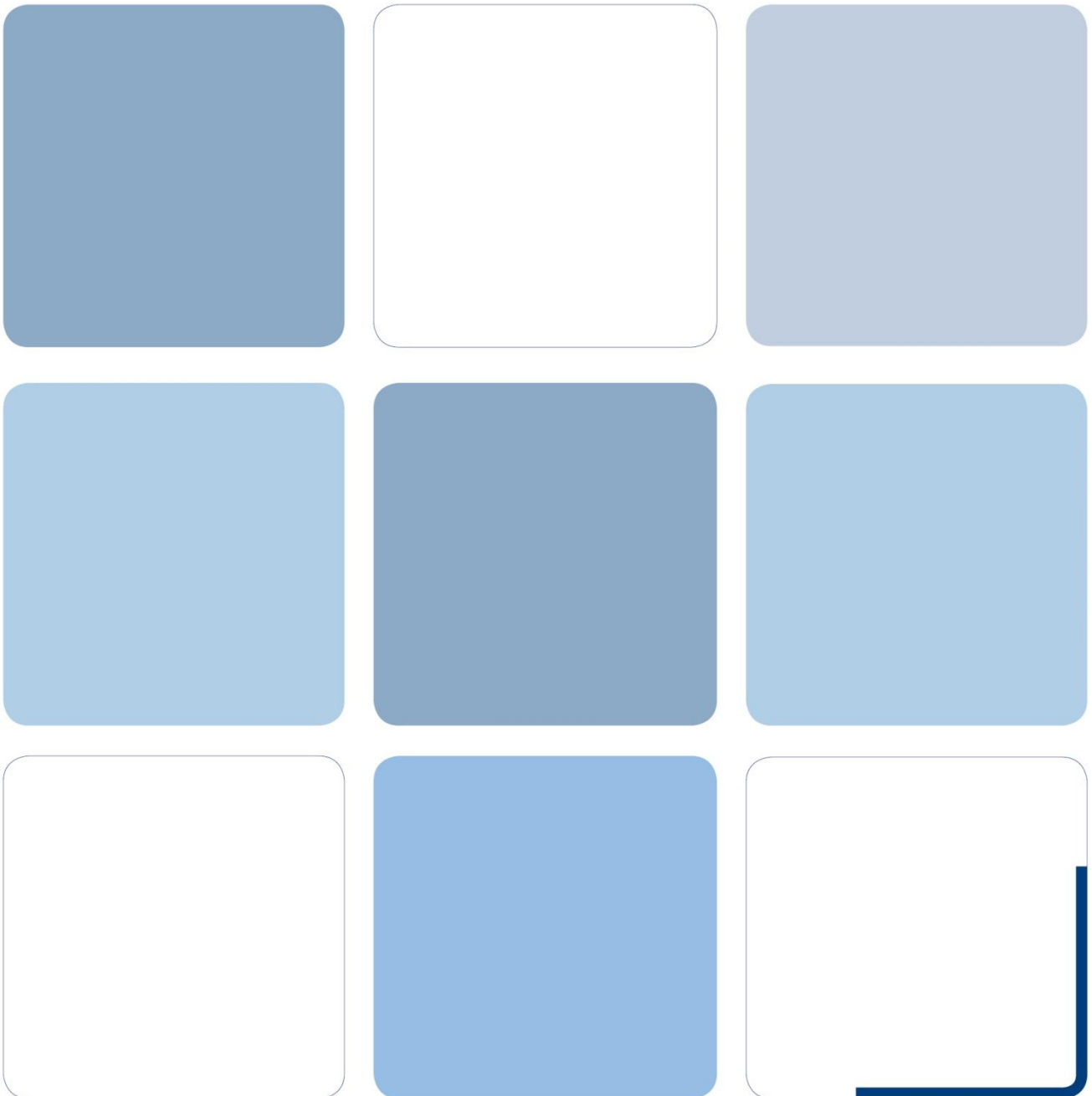




THE HEIGHTS PRIMARY SCHOOL, READING

Arboricultural Impact Assessment



**THE HEIGHTS PRIMARY SCHOOL,
READING**

**ARBORICULTURAL IMPACT
ASSESSMENT**

March 2018

Our Ref: JMK10024

RPS

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Date:	22 March 2018
Project Number/Document Reference:	JMK10024 – THE HEIGHTS PRIMARY SCHOOL – AIA - Rev.A

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1 INTRODUCTION

- 1.1 RPS were instructed in February 2018, by Reading Borough Council, to undertake a Tree Survey and then to prepare an Arboricultural Impact Assessment in relation to proposed development at The Heights Primary School, Gosbrook Road, Caversham, Reading.
- 1.2 The purpose of the statement is to:
- Supply information related to the trees directly affected by the development within the site and provide this base information in the form of tree schedules detailing tree survey data, tree root protection areas and tree work recommendations for retained trees.
 - Provide an updated Tree Constraints Plan – (Figure 1) that identifies constraints to development and indicates the root protection areas for the trees as described in BS5837:2012 - *Trees in Relation to Design, Demolition and Construction - Recommendations*.
 - Provide a Tree Retention / Removal & Protection Plan – (Figure 2) showing trees that will require removal to achieve the proposed development based on the current layout provided by the client, along with the tree protection that respects the root protection areas for the retained trees as described in BS5837:2012 - *Trees in Relation to Design, Demolition and Construction - Recommendations*.
 - Assess to what extent the proposed development will impact upon the health and vitality of the trees on site and make recommendations for mitigation where appropriate.
 - Provide guidance detailing tree protection measures that should be used to allow development and minimise any impact to the trees from the construction of the structures proposed.
- 1.3 The survey and assessment was carried out by Thomas Flood BSc (Hons), Principal Arboriculturist, a Chartered Forester and Professional Member of the Arboricultural Association of RPS Group PLC.

2 SITE INFORMATION

- 2.1 The site comprises a playing field that sits outside of the school playground boundary fence on its northwest aspect. The field is currently accessed via a padlocked gate from the playground. There is carpark to the northeast of the playing field which is accessed via South View Avenue also to the northeast.
- 2.2 The topography of the site is generally level. The site is centred at OS Grid Reference SU 71786 74756.
- 2.3 The school itself has a number of trees growing within its boundaries and these vary in maturity but are largely early mature to mature. The school's trees were surveyed by RPS in the recent past and required updating for the purpose of this assessment. In order to reduce any ambiguity, only the trees from the original survey that may potentially be affected by the development have been included within this assessment, along with any additional trees that were recorded during the latest survey.
- 2.4 It should be noted here that a discussion took place on site between myself and employees of the school regarding the structural integrity of the larger of the two ash (*Fraxinus excelsior*), T15, located within close proximity to the proposed development. This tree exhibits signs that it may have structural impairments that require further investigation (and possibly mitigation) and this is discussed in greater detail in paragraph 3.17 of this report.
- 2.5 It has been confirmed via Reading Borough Council (telephone and email – 22.03.18) that the site is covered by a Tree Preservation Order (TPO7\08) this order pertains to one individual tree (T2) and one Group (G1) being considered in this assessment as T17 and T15/16. The site is not within a Conservation Area.
- 2.6 The following documents have been considered in this statement:-
- Reds10 Ltd – Red Line Boundary Plan - 2044-RH-RLB– Feb 2018

3 TREE QUALITY ASSESSMENT

Tree Retention Values

- 3.1 All trees inspected were categorised using BS5837:2012 and the attached Tree Constraints Plan (see Figure 1) shows tree positions, numbers and retention categories. Trees have been recorded as individuals and as groups.
- 3.2 Trees have been surveyed as groups where they can be considered as forming a group as they form cohesive features either aerodynamically (i.e. they form a discrete group feature providing companion), culturally (i.e. they are composed of trees of a similar size, age and species subject to the same management) or visually (i.e. where the value of the trees within the group is as a whole rather than individually).
- 3.3 Where trees have been surveyed as groups the details recorded with respect to condition and retention value intend to represent an average tree within the group; however, on occasion, it must be noted that there will be exceptions within any group that do not conform to the typical character of that group.
- 3.4 The initial stage of a tree survey in accordance to BS5837:2012 looks at the trees on the site in terms of life expectancy and condition. Trees are then categorised according to their retention value.
- 3.5 **Category A** trees are those that have been assessed as being of a **high** quality and value; significant amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in **Green** on the Tree Constraints Plan.
- 3.6 **Category B** trees are those that have been assessed as being of a **moderate** quality and value; amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in **Blue** on the Tree Constraints Plan.
- 3.7 **Category C** trees are those that have been assessed as being of a **low** quality and value; the loss of these specimens should not be considered as a constraint to development. These trees are shown in **Grey** on the Tree Constraints Plan
- 3.8 **Category U** trees are those that have been assessed as having **no** retention value; these trees should not be a material consideration in the planning process. These trees are shown in **Red** on the Tree Constraints Plan.
- 3.9 Category A, B or C trees are those that should be a material consideration in the planning process while category U trees are those which would be lost in the short term for reasons connected to their physiological or structural condition and hence they should not be a consideration in the

planning process. More detailed information regarding the categorisation of retention values for trees can be found at Appendix 2.

- 3.10 A total of eight individual trees were surveyed along with three groups of trees. The individual trees were distributed across three BS5837:2012 retention categories as such – four Category C (T14 & T22-24), two Category B (T15 & T16) and two Category A (T10 and T17). The three groups (G2-4) were all considered to be Category C.

Physiological Condition

- 3.11 Trees considered to be in a good physiological condition are those with crown density and shoot extension growth levels within the expected ranges for their age and species. Generally, these trees, subject to being of a suitable structural condition, can be expected to make a lasting contribution to the site. Additionally, trees within the good condition class are likely to tolerate changes within their growing environment that occur as a result of development; as such their successful retention will be easier to achieve.
- 3.12 Trees considered to be in a fair physiological condition are those specimens exhibiting lower shoot extension growth and reduced crown density than would typically be expected. These specimens have a lower life expectancy than those within the good condition class and will not tolerate significant changes as a result of development as well as those in the good condition class.
- 3.13 Trees considered to be in a poor physiological condition are those exhibiting crown and shoot dieback and significantly reduced crown density. Trees of a poor physiological condition are not likely to make a lasting contribution to the site and whilst their retention in the short term may be beneficial such retention will only be achievable if the trees are fully protected throughout development as they will not tolerate changes in their growing environment.
- 3.14 Of the eight individual trees, six were deemed to be of good physiological condition (T10, T14-17 & T23) with one being fair (T22) and one being poor (T24). The three groups were all considered to be of good physiological condition.

Structural Condition

- 3.15 There are variations in the structural condition of the trees surveyed; however individual tree condition is largely consistent with expectations for the age, management and species of the tree.
- 3.16 The majority of structural defects that were noted across most of the tree stock on the site, such as minor deadwood in tree crowns, were not considered significant and are unlikely to result in the premature failure of the main stem.
- 3.17 It should be noted here that a discussion took place on site between myself and employees of the school regarding the structural integrity of the larger of the two ash (*Fraxinus excelsior*), T15, located within close proximity to the proposed development. This tree is a prominent veteran ash

with a number features, including the emergence of fungal brackets between two buttresses at the base and also early emergence of another bracket at a separate location. I was informed that the tree had been inspected recently and recommendations had been made for the tree to be heavily reduced, presumably to reduce loading on what might be a weakened stem. Given the trees advanced age but relatively good physiological condition, I would recommend that the tree undergo an internal decay detection assessment to assist in ascertaining the extent of fungal activity within the stem. The stem itself is very large and robust and would be able to tolerate a degree of fungal activity, potentially for a number of years. In addition to this, the crown is healthy with no major deadwood or dieback occurring. If the tree's crown were to be heavily reduced it would leave very large pruning wounds which will be an entry point for further decay and may actually shock the tree into decline. The decay detection would give a more rounded idea as to extent of decay and thus the extent to which mitigation pruning might be required.

- 3.18 A schedule of preliminary tree work recommendations have been made that are included in Table 3 at the end of this report.

Age Distribution & Species

- 3.19 Trees assessed as being young (Y) in age are those considered to be less than 10 years old. These trees can generally be considered to have the potential for rapid and significant future growth. Whilst these specimens are not likely to make a substantial contribution to the landscape character of the site at present they will, if retained, provide succession for the eventual removal of mature or over-mature trees as a result of declining physiological or structural condition.
- 3.20 Trees assessed as being semi-mature (SM) are those of more than 10 years old but having attained less than 40% of the maximum lifespan expected for the species. These trees will generally make some contribution to the current landscape character and appearance of the site and their retention will provide a more immediate succession of mature trees. As with young trees these specimens will have the potential for rapid and significant future growth.
- 3.21 Early-mature trees (EM) are those considered to have reached between 40% and 70% of their ultimate life expectancy. These trees are generally not considered to have a significant potential for future growth though they will increase in size at a slower rate than young and semi-mature trees.
- 3.22 Mature trees (M) are those considered to have reached between 70% and 100% of their species life expectancy. These trees will have little future growth potential and they have generally reached their maximum expected size for the location. These trees will generally make the highest contribution to the landscape character of the site at this time; however, a tree stock over dominated by mature trees will require careful management to ensure that a continuation of canopy cover can be achieved.
- 3.23 Over-mature trees (OM) are those considered to have existed for longer than typical of their species. They do not have the potential to increase in size and may in fact reduce in size as their

crowns begin to break up. These trees will often make a significant contribution to the landscape character of the site and are likely to have ecological value. However, the retention of these trees within new development must be carefully planned as they are approaching the end of their useful life expectancy and they will often have structural defects. Where over-mature trees are to be retained in new development it is essential that access is available for their eventual removal.

- 3.24 Veteran trees (V) are those that show features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species. These trees have negligible potential to increase in size. Veteran trees are usually of a high ecological value and they will require sensitive management where they are to be retained in new development. As such it is again essential that they are located in areas where access is available to undertake management operations and where there is a reduced risk of harm occurring from failure of the trees.
- 3.25 The eight individual trees fall within the following age classes one veteran (T15), one over mature (T24), four mature (T10, T14, T16 & T17) and two semi mature (T22 & T23).
- 3.26 The three groups of trees were distributed between two young (G2 & G3) and semi mature (G4).
- 3.27 Below is a list of the scientific and common names for tree species recorded at the site.

Scientific Name	Common Name
<i>Acer pseudoplatanus</i>	Sycamore
<i>Aesculus hippocastanum</i>	Horse chestnut
<i>Carpinus betulus</i>	Hornbeam
<i>Crataegus monogyna</i>	Hawthorn
<i>Fagus sylvatica</i>	Beech
<i>Fraxinus excelsior</i>	Ash
<i>Populus tremula</i>	Aspen
<i>Sambucus nigra</i>	Elder

Visual Amenity

- 3.28 The trees on site are of high amenity value with respect to employees and students of the school as well as to the wider area.

4 ARBORICULTURAL IMPACT GUIDANCE

Tree Retention / Removal

- 4.1 The prioritisation for tree retention should be based upon the guidance contained within BS5837: 2012. Category A trees should be seen as the highest priority for retention and Category C the lowest.
- 4.2 Category U trees have no retention value and in most circumstances such specimens will not be considered for retention within new development.
- 4.3 When considering the extent of tree retention on site with respect to Category C trees priority should be given to the trees that have been included within this category due to their having stem diameters of less than 150mm at 1.5m above ground level, as these specimens are relatively young trees with future potential.

Considerations for Demolition

- 4.4 There will be no requirement for demolition works in this instance as there are no structures on site to be demolished. The following general guidance should be followed when removing any existing hard surfacing and during construction.

Removal of Existing Hard Surfaces

- 4.5 As with the demolition of existing structures, care must be taken in the removal of areas of hard surfaces which are present within the RPA of trees.
- 4.6 Where existing hard surfaces are located within the RPA of retained trees care should be taken to prevent disruption to tree roots that may be growing beneath it.
- 4.7 In this respect, their removal should generally be undertaken using hand held tools though, under arboricultural supervision, appropriate heavier machinery could be used.
- 4.8 Where machinery is used to remove a hard surface in close proximity to a retained tree, works should progress away from the tree so that at no time the machine moves over newly exposed ground.
- 4.9 Ground protection should be put in place where new areas of exposed ground exist or alternatively the area should be isolated through the installation of tree protection fencing until the replacement surface is to be constructed.
- 4.10 If a new hard surface is to be constructed it may be preferable to leave any existing sub-base in situ, augmenting it where required, so as to minimise impacts to underlying roots.

Considerations for Construction

- 4.11 The following factors will need to be considered during the planning of the construction phase of the development to ensure that retained trees remain unharmed.

Working Within or Near the RPA

- 4.12 Where possible all construction shall be situated outside of retained trees designated RPAs as the installation has the potential to cause soil compaction, root damage and to reduce nutrient and moisture availability to tree roots to the detriment of tree health and vitality.
- 4.13 Where there is an overriding justification for working within the RPA of a retained tree, technical solutions might be available that prevent damage to the tree.
- 4.14 In this respect, it can be noted that the use of traditional trenching methods within the RPA could result in extensive root loss and should be avoided.
- 4.15 In order to arrive at a suitable solution site specific advice should be sought from the project arboriculturist and an engineer.
- 4.16 Generally speaking should new buildings be proposed within the RPA of an existing tree it will be necessary to take steps to minimise the potential impact to the tree to allow construction.
- 4.17 In this respect where it is intended to undertake construction operations within the RPA, precautions should be taken to maintain the condition and health of the root system and in particular to:
- a) Prevent physical damage to the roots during demolition or construction (such as by soil compaction or severing);
 - b) Make provision for water and oxygen to reach the roots;
 - c) Allow for the future growth of the root system; and
 - d) Preserve the soil structure at a suitable bulk density for root growth and function (in particular for soils of a high fines content).

New Hard Surfaces within RPA

- 4.18 If there is a requirement for new hard surfacing to be located inside of the RPA of any retained tree, where possible the construction of these surfaces should be designed using the principles set out within BS5837: 2012 regarding 'no dig' surfacing.
- 4.19 Site specific and specialist arboricultural and construction design advice should be sought to determine if it is achievable without significant adverse impact upon trees to be retained.
- 4.20 Further information regarding hard surface installation around trees is provided at Appendix 5.

Proximity of Structures to Trees

- 4.21 Where new structures are proposed which are to be located in proximity to existing trees the need for working space to construct the proposed development should be considered.
- 4.22 The construction of new structures in close proximity to trees can result in damage to trees and structures by the continuous whipping of branches against the fabric of a building. Therefore structures should usually be located with due consideration to a trees ultimate growth so as to reduce the need for frequent pruning or other maintenance.
- 4.23 Where large old trees are to be retained it is important that adequate space is allowed for their long term physical retention and for future maintenance.

Service Installation

- 4.24 All service runs, utilities and similar infrastructure should take note of trees and allow for working methods that will minimise damage to trees by referring to documents such as NJUG Volume 4 – ‘Guidelines for the planning, installation and maintenance of utility services in proximity to trees’ (National Joint Utilities Group 2007). Existing service/utility routes should be considered as the default for the proposed building.

New Tree Planting

- 4.25 Where tree planting is proposed, size and position should be considered, along with suitability of the species for the site. New tree planting should be measured and provide greater species diversity where possible so as to promote resilience and sustainability going forward. Consideration for initial maintenance through establishment should form part of the mitigation specification.
- 4.26 The new guidance provided in BS8545:2014 Trees: from nursery to independence in the landscape should also be considered and its recommendations followed.

5 ARBORICULTURAL IMPACT ASSESSMENT

Introduction

- 5.1 Trees have finite energy reserves, developed each year throughout the growing season, which are utilised for biological processes such as growth and defence against pests or diseases throughout the following year.
- 5.2 Any development in proximity to trees has the potential to cause harm to those trees unless control measures are identified and acted upon; as such it is essential to consider the relationship between the proposed works and the retained trees to identify what precautions are necessary, proportionate and appropriate.
- 5.3 Any works adjacent to trees have the potential to impact upon the above ground and below ground parts of trees.
- 5.4 While some damage that occurs, such as physical damage to the trees' stems and branches from machinery movements can be clearly visible the impact from other aspects of work common on development sites which can have a significant effect upon the continued health of trees is not always immediately evident.
- 5.5 Damage that is not immediately evident but which can cause long term harm to retained trees include damage to the soil structure by compaction which can cause root damage and changes in site levels can alter the water table and affect moisture availability.
- 5.6 To minimise the potential for harm to occur to retained trees all works should be carried out with regard to the tree protection measures detailed within this report.
- 5.7 In general it can be seen that, by adopting appropriate methods of working, precautionary and protective measures, significant harm to retained trees can be avoided.
- 5.8 In particular the establishment of a Construction Exclusion Zone (CEZ) will reduce the potential for harm to occur to retained trees.

Brief Description of Development Proposals

- 5.9 The proposals are for a new modular building, similar to the existing one found within the school borders, to be installed within a playing field that sits adjacent the school playground on its northeast aspect. The modular structure will provide additional classroom space and will be assembled using the field access to the northeast. The structure will have a footpath that extends around the perimeter of the building with links to the southwest corner of the field.

Tree Retention / Removal

- 5.10 Of the trees surveyed it is anticipated that three Category C individuals (T22-24) would require removal in addition to a Category C group (G3) in its entirety. It is also likely that one tree of the Category C group G4 would require removal due to its encroachment into the proposed location of the modular structure and its perimeter footpath.
- 5.11 All the trees that would likely require removal to facilitate this development are of low quality and should not be considered a significant constraint to this development. The removals are required based on the current proposals we have been provided and are due to proximity of the proposed structure and its perimeter footpath to the RPAs and crowns of the trees.
- 5.12 The majority of the removals are located outside of the fence line of the school playground and therefore ownership we are currently unaware as to ownership.
- 5.13 The proposed tree removals can be seen on the Tree Retention / Removal & Protection Plan (see Figure 2).

Work Considerations

- 5.14 To ensure that the trees that are to be retained do not suffer harm during the proposed works the following factors have been considered.

Root Protection Area (RPA)

- 5.15 RPAs for each tree should be determined in accordance with BS5837:2012 Section 4.6, this information will provide the rootable soil volume, required for protection.
- 5.16 The proposals include a perimeter footpath that extends around the perimeter of the modular building and extend away to the southwest corner of the field. The footpath bisects the considerable RPA of the veteran ash, T15, and this will require an approach that alleviates the need to excavate or cap the soils. The solution to this would be to either use a load spreading temporary surface or alternatively, if a more permanent surface is required, the use of a 'no-dig' constructed footpath.
- 5.17 The principle of no-dig construction is to avoid entirely the stripping of surface soils in order to provide a base for a traditional wearing course. The no-dig system, an example being Geosynthetics Cellweb®, uses a cellular confinement system with granular infill (no fines) which is assembled on top of existing ground level, normally with a wooden edging to hold it in place. The permeable wearing course is then put in place on top of this to finish. This type of system, as previously mentioned, removes the need to excavate which could damage roots, but also reduces potential soil compaction and allows free movement of moisture.
- 5.18 All works, where possible shall be situated outside of the retained trees' designated RPAs.

- 5.19 All protective fencing and other measures should be on site and in place before ANY site preparation or construction work commences.

Existing Canopy Spreads

- 5.20 Where the RPAs for retained trees do not extend to the edge of existing canopy spreads it is possible that those parts of the trees extending beyond the RPA fencing may sustain damage during construction.
- 5.21 Where this occurs, there are two primary options available to manage and minimise the potential for damage to tree canopies to occur during development and these may be used singularly or in combination. The first option is to create a Construction Exclusion Zone (CEZ), by the erection of protective fencing, around the full extent of the trees. The second is to undertake pruning works to the trees to reduce the potential for branch damage to occur. The first option will be the default.
- 5.22 In this instance, the vast majority of trees whose canopies encroach into the proposed modular building and its associated footpath are to be removed. It is therefore unlikely that any additional pruning would be required. While unlikely it is possible that as the project develops issues relating to crown spreads and any potential encroachment into the works area may emerge and these instances will need to be assessed in greater detail at the time.

Site Compounds and Materials Stores

- 5.23 Provision for materials storage, site offices, deliveries and other related activities should be made available in areas away from trees. Materials should be brought on site as required and any material generated as part of the works that requires removal from site should be stacked either off site or away from the trees.
- 5.24 In this instance, there should be ample space within the field itself, outside of the CEZ formed by the tree protection fencing, to accommodate building materials and any facilities that may be required.

Levels Changes

- 5.25 Any level changes adjacent to trees should be assessed for their impact. Particular care should be taken with respect to mature trees, as these cannot respond to changes as rapidly as younger trees. It is noted that any level changes will be well beyond the RPA of any tree.
- 5.26 It is not anticipated that the development would require any significant levels changes due to the current topography and the modular nature of the build.

Service Installation

- 5.27 All service runs, utilities and similar infrastructure should take note of trees and allow for working methods that will minimise damage to trees by referring to documents such as NJUG Volume 4 - Guidelines for the planning, installation and maintenance of utility services in proximity to trees (National Joint Utilities Group 2007).

New Tree Planting

- 5.28 For any new tree planting that forms part of the landscape proposals for the application, size and position should be considered, along with suitability of the species for the site. New tree planting should be measured and provide greater species diversity where possible so as to promote resilience and sustainability going forward. Consideration for initial maintenance through establishment should form part of the mitigation specification.
- 5.29 The new guidance provided in BS8545:2014 Trees: from nursery to independence in the landscape should also be considered and its recommendations followed.

6 RECOMMENDED WORKS SPECIFICATION

Tree Felling Works

- 6.1 There is requirement for tree removals and this should be done prior to any works commencing. These works should be carried out using guidance found within BS3998:2010 Tree Work – Recommendations.
- 6.2 The trees that require removal are shown in red on the Tree Retention / Removal & Protection Plan (see Figure 2).

Tree Pruning Works

- 6.3 Any pruning works should be undertaken in accordance with BS3998:2010 Tree Work – Recommendations.
- 6.4 Any tree pruning works would need to be assessed in greater detail closer to the time of implementation.

Tree Protection

- 6.5 There is a requirement for protective fencing to be erected and this should be completed in accordance with the guidance contained within BS5837:20012 Trees in Relation to Design, Demolition and Construction - Recommendations. All tree protection measures are shown on the Tree Retention / Removal & Protection Plan (Figure 2).
- 6.6 The use of a fixed line of tree protection fencing, around the tree adjacent to the works should be used to provide adequate protection during the works. Once the fixed line of protective fencing is in place it must remain in situ throughout the course of the works until all operations are complete. The fixed line will form the outline of the CEZ.
- 6.7 Copies of the Tree Retention / Removal & Protection Plan should be placed in the site office for reference by all site staff.
- 6.8 The protective fencing barrier is to be constructed in accordance with the specification detailed at Appendix 3.
- 6.9 Signs detailing the purpose of the protective fencing shall be attached to the fencing at 10m intervals. Such signs should be weatherproof and shall be substantially in the form of the specimen provided at Appendix 4. Signs must be replaced as necessary should they be removed or become illegible.
- 6.10 Following erection of the protective fencing and prior to commencement of the works it is recommended that an inspection of the site by the Council's Tree Officer be arranged to confirm

fencing has been installed in accordance with the Tree Retention / Removal & Protection Plan (Figure 2).

Construction Exclusion Zone (CEZ)

- 6.11 The CEZ as defined by the fixed protective fence line and shall be regarded as sacrosanct, and the protective fencing shall not be moved or taken down at any time.
- 6.12 Within the CEZ there must be no mechanical digging or scraping, no alteration to existing ground levels including soil stripping, no earthworks and no handling or discharge of any chemical substance, concrete washings or of any fuels.
- 6.13 Furthermore vehicular or pedestrian access along with the storage of any materials is prohibited within the CEZ.
- 6.14 Additionally no materials that may contaminate the soil such as concrete mixings, diesel oil and vehicle washings shall be discharged within 10m of the stem of any tree and no fires shall be lit within 10m of the maximum extent of a trees crown.

Site Access Point

- 6.15 The proposed access point will be via the existing field entrance on its northeast boundary.

Site Compounds and Materials Stores

- 6.16 Activities related to the establishment of a temporary site compound have the potential to impact upon retained tree by various means. In particular the storage and mixing of chemicals and materials such as concrete can have a damaging effect on tree health if precautions are not taken.
- 6.17 To prevent harm occurring to trees provision for materials storage, site offices, deliveries and other related activities should be made available in areas away from trees.
- 6.18 There should be sufficient space within the field to accommodate a site compound during construction.

Monitoring

- 6.19 Following erection of the protective fencing and prior to commencement of the works an inspection of the site, by either the Council's Tree Officer or the Arboricultural Consultant, should be arranged to confirm fencing has been installed in accordance with the Tree Retention / Removal & Protection Plan (Figure 2) and any relevant conditions that may be attached to a grant of planning consent for the development.

Reporting

- 6.20 Should any arboricultural issues become apparent during the works the site manager should immediately contact the Arboricultural Consultant (Thomas Flood – 01908 302634 or thomas.flood@rpsgroup.com) or the Council's Tree Officer for advice upon how to proceed.

7 CONCLUSIONS

- 7.1 The site comprises a playing field that sits outside of the school playground boundary fence on its northwest aspect. The field is currently accessed via a padlocked gate from the playground. There is carpark to the northeast of the playing field which is accessed via South View Avenue also to the northeast.
- 7.2 The proposals are for a new modular building to be installed within a playing field that sits adjacent the school playground on its northeast aspect. The modular structure will provide additional classroom space and will be assembled using the field access to the northeast. The structure will have a footpath that extends around the perimeter of the building with links to the southwest corner of the field.
- 7.3 It has been confirmed via Reading Borough Council (telephone and email – 22.03.18) that the site is covered by a Tree Preservation Order (TPO7\08) this order pertains to one individual tree (T2) and one Group (G1) being considered in this assessment as T17 and T15/16. The site is not within a Conservation Area.
- 7.4 Of the trees surveyed it is anticipated that three Category C individuals (T22-24) would require removal in addition to a Category C group (G3) in its entirety. It is also likely that one tree of the Category C group G4 would require removal due to its encroachment into the proposed location of the modular structure and its perimeter footpath.
- 7.5 It will be necessary to implement a 'no-dig' policy on any footpaths that bisect the RPA of any of the significant retained trees. This would require either temporary load bearing surfaces or, if a more permanent solution is required, a cellular confinement system such as Geosynthetics Cellweb ®.
- 7.6 The use of tree protection fencing acting as a CEZ will ensure that the retained tree located to the east of the working area is fully protected during the works.
- 7.7 Guidelines contained within BS5837:2012 Trees in Relation to Design, Demolition and Construction should be followed when dealing with trees in these situations. Working methods and specifications should be followed to limit potential damage to trees throughout the works proposed.
- 7.8 The importance of supervision during the works should not be underestimated. If any arboricultural issues relating from works being carried out occurs, then they should be reported to the main contractor immediately.

TABLE 1 – TREE SURVEY DATA

Key to Inspection Report Form

Species	Genus and variety
Height	Measured Clinometer Reading or Estimated Height in Metres
Girth (dbh @ 1.5m)	Diameter measured in cms, or estimated, Where multi stemmed conventions within BS5837:2012 have been applied.
Spread (m)	Canopy height estimated in metres above ground level, Height of first branch and direction has been noted.
Canopy height (m)	Crown Spread, radius estimated in metres
Physiological Condition	Good, Fair, Poor, Dead
Age Class	Y – Young SM – Maturing (Young to Middle Aged) EM – Early Mature (Middle to mature aged) M – Mature OM – Over mature, V – Veteran
Useful Life Expectancy (years)	10, 10-20, 20-40, 40+
BS Categorization	See Cascade Appendices 2

Table 1: Tree Data Schedule

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
10	Carpinus betulus	650	20	7	5	7	4.5	2.5	SW	2	M	Good	40+	Tree is leaning at a 10angle in a NEdirection.Pruning wounds to stem and crown.Hard surface located in RPA.	A2
14	Fraxinus excelsior	500	15	8	4	8	2	3.5	NE	3	M	Good	20-40	Heavily suppressed crown.Deadwood in the crown of minor extent.General poor form to tree.Hard surface located in RPA.	C1
15	Fraxinus excelsior	1150	20	8.0	5.0	2.0	9.0	4.0	NW	2.5	V	Good	20-40	Pruning wounds to crown.Deadwood in the crown of minor extent. Old ash growing closely with neighbor. Ganoderma brackets growing between butress on NE side. More brackets emerging on west side at base. Two primary limbs fused in the past, one became dysfunctional and has died off leaving limb with poor attachmen	B3
16	Fraxinus excelsior	920	20	2.0	8.0	7.0	5.0	9.0	North	2.0	M	Good	20-40	Pruning wounds to crown.Deadwood in the crown of minor extent.Hard surface located in RPA. Old ash growing closely with older neighbor.	B3
17	Acer pseudoplatanus	600	14	7	8	5	8	2	North	2.5	M	Good	40+	Pruning wounds to crown.Deadwood in the crown of minor extent.Hard surface located in RPA. Good quality specimen.	A1
22	Crataegus monogyna	140	5	1.5	0.0	1.0	1.5	2.0	North	2.0	SM	Fair	10-20	Heavily suppressed crown.Restricted inspection due to ivy.General poor form to tree.	C2

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
23	Fraxinus excelsior	200	12	5.0	0	1	4	4	North	5	SM	Good	10-20	Tree is leaning at a 20angle in a Northdirection.Bark damage.Heavily suppressed crown. Growing through chainlink fence.	C2
24	Sambucus nigra	220	8	3	4	4.5	4.5	2.5	North	2	OM	Poor	10-20	Pruning wounds to stem and crown.Multi stemmed stem formed at 0.0 metres.Deadwood in the crown of moderate extent.Branch dieback of moderate extent.Tree has no long term potential. Leader has died off leaving deadwood with dried saprophytic fungal brackets.	C1

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied

Table 1: Group Data Schedule

Group No.	Species	Min/Max Diameter (cm)*		Average Height (m)	Average Crown Spread	Ave. Crown Height	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G2	Populus tremula	5	14	6	2	2	Y	Good	10-20	Restricted inspection due to vegetation.Group of general poor form, Self-seeded aspen form the majority.	C2
	Crataegus monogyna										
G3	Populus tremula	5	10	9	2	2	Y	Good	10-20	Restricted inspection due to vegetation.Group of general poor form, Self-seeded aspen.	C2
	Fagus sylvatica										
G4	Fraxinus excelsior	10	25	13	3	3	SM	Good	10-20	Hard surfaces within root area. Restricted inspection due to ivy.Group of general poor form, Self-seeded cluster of trees along new boundary.	C2
	Aesculus hippocastanum										

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied

TABLE 2 – ROOT PROTECTION AREAS

Table 3: Tree Root Protection Areas

Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
10	Carpinus betulus	A2	7.8	191.1	13.8
14	Fraxinus excelsior	C1	6	113.1	10.6
15	Fraxinus excelsior	B3	13.8	598.3	24.5
16	Fraxinus excelsior	B3	11.04	382.9	19.6
17	Acer pseudoplatanus	A1	7.2	162.9	12.8
22	Crataegus monogyna	C2	1.68	8.9	3
23	Fraxinus excelsior	C2	2.4	18.1	4.3
24	Sambucus nigra	C1	2.2	15.2	3.9

Table 3: Tree Root Protection Areas - Groups

Tree No.	Species	BS5837 Category	RPA Radius (m)
G2	Populus tremula Crataegus monogyna	C2	1.68
G3	Populus tremula Fagus sylvatica	C2	1.2
G4	Fraxinus excelsior Aesculus hippocastanum	C2	3

TABLE 3 – PRELIMINARY TREE WORK RECOMMENDATIONS

Table 2: Tree Works Required

Tree No.	Species	Diameter (mm)*	Height	Age Class	Vigour	Structural Condition	Life Expectancy	Comments	BS5837 Category	Works Required
15	Fraxinus excelsior	1150	20	V	Good	Poor	20-40	Pruning wounds to crown.Deadwood in the crown of minor extent.	B3	Crown reduce the tree by 20 %. Decay detection recommended. Remove limb with poor attachment.
24	Sambucus nigra	220	8	OM	Poor	Poor	10-20	Pruning wounds to stem and crown.Multi stemmed stem formed at 0.0 metres.Deadwood in the crown of moderate extent.Branch dieback of moderate extent.Tree has no long term potential.	C1	Deadwood the tree crown.

FIGURE 1 – TREE CONSTRAINTS PLAN

FIGURE 2 - TREE RETENTION / REMOVAL & PROTECTION PLAN

APPENDIX 1 – SURVEY METHODOLOGY

General

On site data was recorded onto site copies of forms.

The site data was transposed in the office into an MS Access database. Individual tree numbers and locations were plotted by eye on to a drawing at the time of the survey. Tree positions were then related to a Topographical survey of the site provided, where not shown on the topographical survey tree positions have been plotted by eye only and require confirmation. Colour coded versions of the drawings form part of this report. (Figure 1).

The data recorded includes:

- Height - data gathered using a Suunto optical clinometer PM - 5/1520. Where access to the tree was not possible the Heights were estimated.
- Diameter - measurements taken at 1.5 metres above ground level (complying with requirements for BS5837). Where multiple stems were observed, conventions contained within BS5837:2012 were followed. Girth data was gathered using a metric diameter tape, callipers or estimated when no access.
- Tree crown spread – estimated measurement of the four cardinal points to provide information to be used with the arboricultural constraints plan
- Tree Crown Clearance – crown height above ground level
- Tree condition - judged visually using the guidelines produced in the report. The condition is indicated with the appropriate colour on the map found in the report. (see Figure 1)
- Age class - estimated from an examination of the tree in question.

Age Classification

The following classification is employed:

Y - Young:	Saplings and young trees under 10 years of age
SM – Semi Mature	Tree great than 10 years old below one third of their life expectancy
EM – Early Mature:	Trees older than one third of the life expectancy of their species, normally making substantial extension growth.
M - Mature:	Trees between one third and two thirds of the life expectancy of their species. More or less full height and large girth, increasing only slowly.
OM- Over mature:	Trees beyond two thirds of the life expectancy of their species. No significant extension growth. Crown starting to break up and decrease in size.
V – Veteran:	tree that shows features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species.

Estimated Remaining Contribution in Years

The estimated remaining contribution in years is an estimate based on currently known factors of the possible remaining life of the tree as an asset. Clearly, it is impossible to predict changes in condition which may occur in the future and this reflects what is considered reasonable under existing circumstances, the following classification is employed:

Death or removal is likely within less than 10 years

Death or removal is likely within 10-20 years.

Death or removal is likely within 20-40 years.

Death or removal is likely beyond 40 years

The estimated remaining contribution in years will be dependent on the interaction of the typical longevity of the species, its current age and condition with prevailing environmental factors. The estimated remaining contribution in years also dependent on future tree management that can extend useful life in some instances.

Tree Condition.

The tree survey assessed the individual condition of all trees identified on the site. The assessment of condition is based on a visual and professional view.

The categories considered for Physiological Condition are good, fair, poor and dead.

Structural Condition is also commented on and this will include such items of presence of decay and physical defects.

Trees are living organisms and their condition can change rapidly in response to environmental variables. Condition remarks refer to the date of survey and cannot be assumed to remain unchanged. While there is no such thing as a safe tree, regular inspection of trees is recommended to reduce the foreseeable risks associated with trees. There is currently no published guidance from the UK insurance industry on the frequency of tree inspections. In the German courts a bi-annual routine inspection is normally expected for older street trees, giving an indication of the rapidity of change in condition that can occur.

Management Recommendations

Recommendations are given where it is felt by the arborist that further investigations are required due to suspected defects and work recommendations for pre-construction tree work.

Tree Categorisation Using BS5837 Methodology

The trees surveyed were categorised using the method explained in BS5837 Trees in Relation to Design, Demolition and Construction 2012. This method categorizes individual trees, groups and woodlands in a systematic way. Each tree, group or woodland is identified on an attached plan.

Groups are identified as those trees forming a single arboricultural feature with trees that provide companion shelter, are avenues or screens or cultural.

Initially the surveyor will determine if the tree should be regarded as a U category tree. U category trees are those that are low value trees that have little future due to physiological and structural condition.

Other trees are graded A, B or C. The initial category should reflex the trees value in making an important contribution to the amenity of the site over a period of time. The higher the category the longer the perceived time period.

A sub category is included 1, 2 or 3. This sub category reflects the type of value the surveyor feels the tree presents in regards its value to 1 – arboricultural, 2 – landscape, 3 – cultural or conservation.

The cascade chart used is included as Appendix 2 of this report.

APPENDIX 2 – BS5837 TABLE 1 CASCADE CHART

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U 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	☒☒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 NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.			Dark Red
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	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)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Light Green
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	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	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	Trees with material conservation or other cultural value	Mid Blue
Category C 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	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	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	Trees with no material conservation or other cultural value	Grey

APPENDIX 3 – TREE PROTECTION BARRIER DETAILS

Appendix 4 - Root Protection Area Barrier Details

Protective Barrier Specifications

Since trees are living organisms which interact with their immediate environment any changes made to their surroundings may have a bearing on that trees future. Developing a site will undoubtedly place any trees within close proximity under some level of stress, which could predispose them to infection. The aim of this method statement is to limit the amount of stress induced by introducing protection measures.

The most effective way of offering protection is by erecting protective barriers set at a distance from the tree stem using the methods given within BS 5837: 2012 Trees in Relation to Design, Demolition and Construction. Barriers should be braced and constructed to resist impacts; see figures 1 & 2 below for barrier specifications. Barriers can be of an alternative specification to that within the BS5837:2012 provided it is approved by the Local Planning Authority Tree Officer.

Barriers should be erected before any works commence on site with the exception of recommended tree work. Areas of retained and future structure planting should be similarly protected.

All personnel should be made aware of the protected areas and instructed to keep them free of materials, waste and excess soil. Soil disturbance should be prohibited and travel of any kind, including foot traffic should also be excluded within the root protection area (RPA) unless previously agreed and adequate ground protection has been installed. Where foot traffic is agreed within the RPA, single thickness scaffold boards laid over a compressible material on a geotextile, or supported by scaffold should suffice. Where vehicular access through the RPA is agreed an engineer should be consulted to design adequate ground protection methods.

Suggested Barrier Specification (as per BS5837: 2012)

Figure 1

Figure 2 Default specification for protective barrier

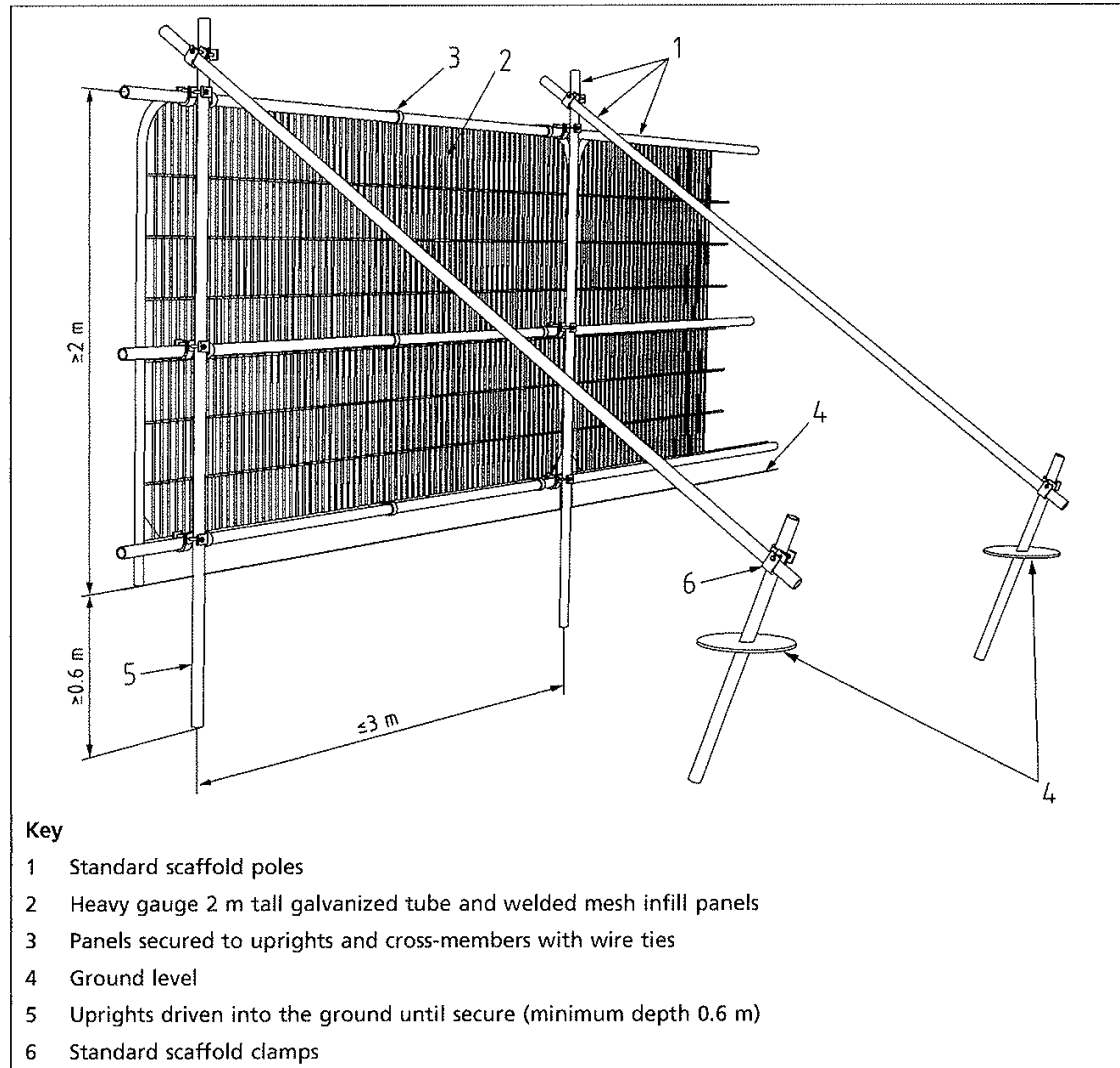
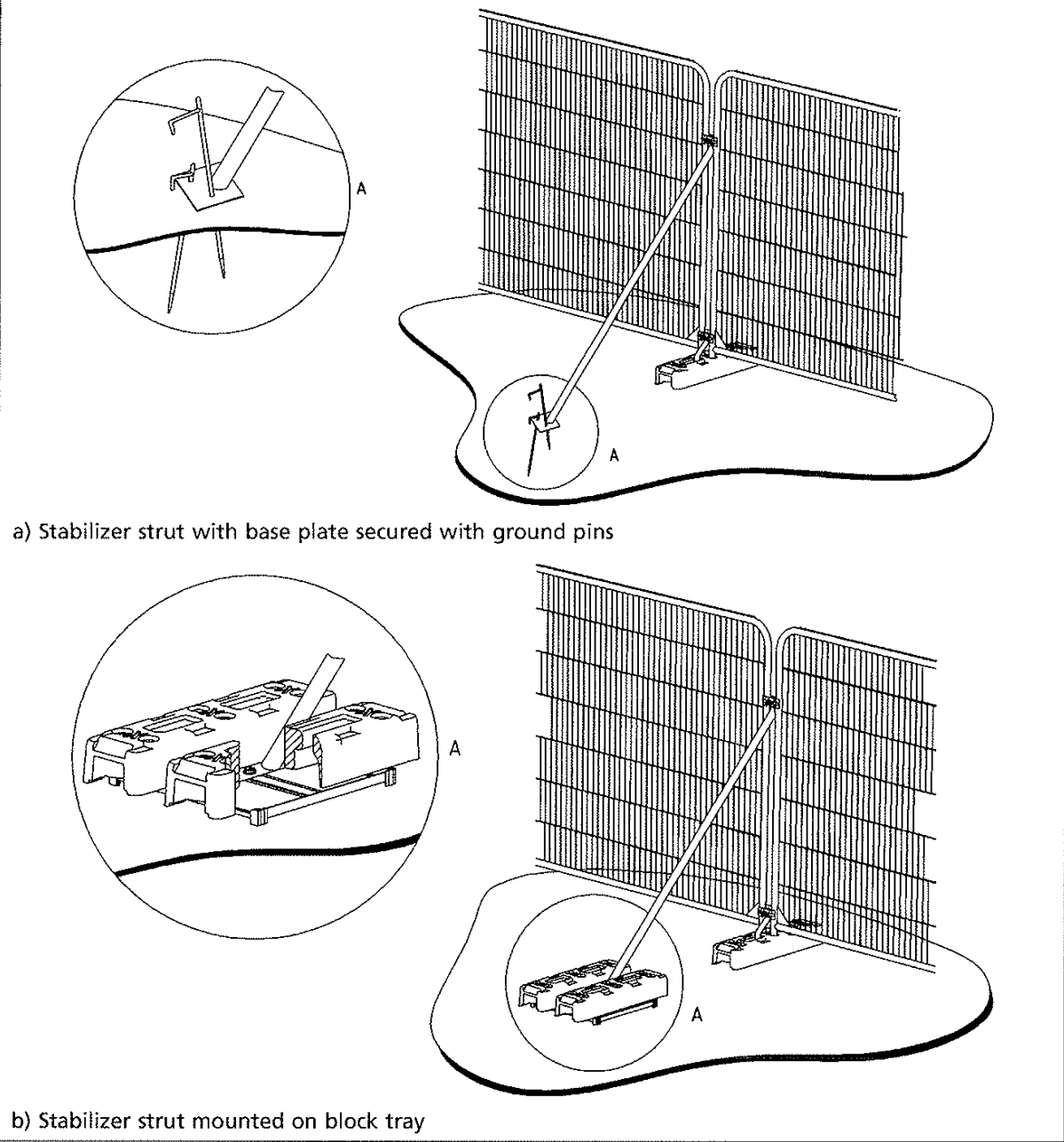


Figure 2

Figure 3 Examples of above-ground stabilizing systems



APPENDIX 4 – CONSTRUCTION EXCLUSION ZONE SIGN



**PROTECTIVE FENCING. THIS
FENCING MUST BE
MAINTAINED IN ACCORDANCE
WITH THE APPROVED PLANS
AND DRAWINGS FOR THIS
DEVELOPMENT.**



**TREE PROTECTION AREA
KEEP OUT !**

**(TOWN & COUNTRY PLANNING ACT 1990)
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY
PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A
TREE PRESERVATION ORDER.
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY
LEAD TO CRIMINAL PROSECUTION**

**ANY INCURSION INTO THE PROTECTED AREA MUST BE
WITH THE WRITTEN PERMISSION OF THE LOCAL
PLANNING AUTHORITY**

APPENDIX 5 – HARD SURFACE INSTALLATION METHODOLOGY

Hard Surface Installation Methodology

The following methodology sets out the requirements and stages in construction of new hard surfaces in relation to existing trees.

This methodology is not meant to be considered as a specification and whilst examples of products that meet the arboricultural requirements for the installation of hard surfacing adjacent to trees are given the final construction detail must be designed by a suitably qualified and experienced engineer, whilst ensuring the arboricultural requirements are met, to ensure that the finished surface is fit for purpose.

In this respect it should be noted that Geosynthetics Limited, who supply cellular confinement systems, offer a design service to develop site specific solutions.

Arboricultural Requirements

Wherever it is intended to undertake demolition or construction operations within the Root Protection Areas of trees precautions must be taken to maintain the condition and health of trees root systems.

In particular:

- Works shall be conducted in such a manner as to prevent physical damage to roots during demolition or construction, such as soil compaction or root severance.
- Provision for water and oxygen to reach the roots must be made and the soil structure must not be disturbed.
- Provision must be made for future root growth and precautions taken to ensure that such root growth does not cause unacceptable levels of damage to the finished construction.
- The soil must not be compacted and soil bulk density must be maintained at suitable levels for tree root growth and function. In this respect a soil bulk density of over 1.8g/cm³ will impede root growth and function.

To achieve the above requirements for tree root growth and function the surface shall be designed so that:

- No excavation is required for their installation; to ensure that physical root damage does not occur.
- The surface can be installed without compaction of the existing soils; thus ensuring damage to the soil structure does not occur.
- The surface is permeable; thus ensuring that oxygen and water can reach the root system and that CO₂ can diffuse vertically out of the soil as high concentrations can cause root suffocation.

There are various methods of creating such a surface however one that is commonly in use and is therefore recommended here is the use of a three dimensional cellular confinement system to provide for load suspension above the existing soil grade and reducing vertical loads on the underlying soils. One such product is CellWeb produced by Geosynthetics.

Prior to installation of any new surfacing the following factors shall be considered:

- The exact location of the area to receive the special surfacing shall be determined.
- The area should be investigated to identify any existing services.
- The area shall be fenced off with tree protection fencing until installation of the special surfacing is to take place. Such installation should generally be phased to occur following substantial completion of the development.
- The final surface shall be decided upon, the surface must be permeable and several options for final surfacing are considered in the following section.

Methodology for Surface Installation

Prior to the installation of the new surface, existing ground cover and surface vegetation should be killed using an appropriate herbicide.

Specialist advice should be sought in order to determine the most appropriate herbicide to use due to the potential for leaching through soils and the potential impacts that this will have on retained vegetation.

As an alternative or addition to herbicide treatment the existing surface vegetation may be carefully removed by using hand tools.

All dead organic matter is to be removed by hand following herbicide treatment to prevent anaerobic conditions, as a result of the decomposition of dead vegetation, occurring.

All major protrusions such as rocks shall be removed by hand and all tree or shrub stumps from removed vegetation shall be ground out to minimize ground disturbance.

The soil surface **must not** be skimmed or stripped to achieve a level surface and where necessary major hollows shall be filled using a granular fill, such as no-fines gravel, washed aggregate or cobbles, to achieve a level surface.

In some cases it may be appropriate to consider the removal of the top layers of soil by non-mechanical means to achieve desired levels, establish rooting patterns and potentially provide for some embedding of the new surface into the existing ground level. Such works shall be completed using pneumatic soil excavation techniques and the works must be supervised by an Arboricultural consultant. The need for such works to occur shall be considered during the detailed design of the surface.

Following surface preparation the soil shall be covered by a permeable geotextile to prevent the cellular confinement fill from migrating into the existing soils.

The geotextile layer shall be laid with overlaps of 300mm beyond the edge of the proposed construction and shall be temporarily retained with pins, stakes or weights.

The cellular confinement system shall then be installed and fixed in position in accordance with the manufacturer's recommendations.

The cellular confinement system shall then be filled with the specified aggregate in accordance with the manufacturer's recommendations. All works involved in the filling of the system with aggregate must be completed by hand and be supervised by the site supervisor.

The infill aggregate shall then be rolled or whacked to ensure cohesion of the granular fill with the cellular confinement system.

The desired finished surface shall then be installed. This shall be permeable and gas porous. Options for the type of finished surface are:

- Washed gravel – This retains porosity unless excessively consolidated and will be particularly useful where the final surface is not level. However it may not be suitable in areas with high pedestrian and vehicular passage. If gravel is used, this shall be distributed in a 75mm layer over the exposed infill aggregate.
- Paving slabs / brick paviors – These shall be laid dry jointed on a bed of sharp sand to allow air and moisture to permeate. Specialist slabs and paviors with inbuilt infiltration holes may be used.
- Tarmacadam – This shall not be used where it will cover over 20% of a trees Root Protection Area.

Following completion of the hard surface protective fencing shall be erected around the trees until the completion of development.

APPENDIX 6 - ARBORICULTURAL GLOSSARY

Abiotic Factors - Non-living factors of the environment, including temperature & wind.

Age-class - A general classification of the tree into either - young, semi-mature/maturing, mature, over-mature, or senescent.

Apical Bud/Shoot – The apical bud, also known as the leading shoot, is responsible for shoot extension and is dominant.

Apical Dominance – A singular, leading shoot remains dominant.

Arboreal - In connection with, or in relation to, trees.

Arboriculturalist – Person who has, through relevant education, training and experience, gained recognised qualifications and expertise in the field of trees in relation to construction.

Arboricultural Implications Assessment (AIA) – Study, undertaken by an arboriculturalist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.

Arboricultural Method Statement (AMS) – Methodology for the implementation of any aspect of development that has the potential to result in the loss of or damage to a tree. Note The AMS is likely to include details of an on-site tree protection monitoring regime.

Biotic factors - Living factors. For example, animals and pathogens.

Bottle Butt – Term used to describe shape of stem base, usually associated with an internal defect – refer to 'Reaction Wood' below.

Branch union/junction - The point at which a branch joins a larger stem. Can be a point of weakness, especially in certain species.

Cambium - A lateral meristem (see below) in vascular plants located just beneath the bark responsible for secondary growth, e.g. production of annual growth rings.

Canker – A clearly defined area of dead and sunken or malformed bark, caused by bacteria or fungi. Can have a bearing on structural integrity of infected limb(s) depending on size and location.

Chlorosis/Chlorotic – Abnormal yellow or yellow-green coloration of usually green leaves. Essentially a reduction of chlorophyll levels often as a result disease or nutrient deficiency.

Co-dominant stems - A growth characteristic, where two or more stems of similar size grow from the same point. Can create an inherent weakness.

Compaction - The compressing & hardening of soil around tree root systems, due to vehicular/pedestrian use etc. Loss of pore space between soil granules limits water movement and gaseous exchange, and inhibits root growth.

Competent person – Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached

Note 1 A competent person understands the hazards and the methods to be implemented to eliminate or reduce the risks that can arise. For example, when on site, a competent person is able to recognise at all times whether it is safe to proceed.

Note 2 A competent person is able to advise on the best means by which the recommendations of this British Standard may be implemented.

Condition – Assessment based on a visual and professional view giving consideration to many factors such as tree health, structural integrity and suitability of its position.

Construction Exclusion Zone – Area based on the RPA (in m²), identified by an arboriculturalist, to be protected by development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree.

Coppice - The method of managing trees by cutting the stems at between 1.0 inch and 1.0 foot from the ground level on a regular cycle, the cut stumps of the trees or shrubs are allowed to re-grow many new stems.

Crown spread - Gives distances between extreme limits of the crown and the stem, usually along the four compass points. Helps to show crown symmetry.

Crown Reduction – The removal of branch ends to reduce the extreme limits of a trees branch spread and height.

Crown Thin – The removal of selected branches within the crown to thin the internal branch structure.

D.B.H. - 'Diameter at Breast Height', an industry standard to gauge tree stem size and development. Within arboriculture, breast height is taken to be 1.5m above ground level.

Dieback - The reduction in crown vigour and extension growth progressing to death of distal parts; often associated with decline.

Epicormic/adventitious growth - New growth from dormant buds that can often form tenuous attachments. Although some species readily form such shoots, it can be an indication of stress.

Feathered Whip – Size of tree for planting, usually ranging from 1.25m to 2.5m in height.

Form - A general assessment of the shape and position of the tree within its' environment.

Frass – Debris such as bore dust left by wood boring insects.

Hanger – Term used to describe a branch that has become detached and is being supported by other branches. Can be a hazard to persons and property below.

Hazard Beam – After the loss of a distal part, a limb concentrates growth upwards creating adverse end weights that can render the limb susceptible to failure.

Heavy Standard – Size of tree for planting, usually above 3.5m in height.

Included bark – Growth characteristic usually caused when two or more stems/branches growing in close proximity ‘fuse’ together entrapping the bark from when the parts were separate in the middle, creating a structural weakness.

Meristem - The undifferentiated plant tissue from which new cells are formed, such as that at the tip of a stem or root.

Meristematic Disorder – A growth disorder caused by a disruption of the meristem (see above) from any of a number of biotic factors (see above). Manifests as growths such as ‘Witches Brooms’ & ‘Galls’.

Necrosis/Necrotic – Death of tissues usually characterised by a blackening in colour.

Occlusion/Occluded – Normally used to describe the overgrowth of a wound. Also, immovable foreign objects in contact with a tree part can become encased or ‘occluded’ by the tree as it grows incrementally.

Pathogen - An agent that causes disease, especially a living microorganism such as a bacterium or fungus.

Plasticity index - The table used to calibrate the shrinkability of a clay soil.

Pollard – The removal and subsequent regular re-removal of the crown of a tree above animal browsing height. Can be an effective method of controlling the size of trees in urban areas. This is ideally begun in the trees early stages and maintained throughout its life.

Reaction wood - Essentially additional wood laid down by the tree to compensate for structural defects such as cavities.

Ring barking/Girdling – the removal of bark around the entire circumference of a stem or branch, causing the death of all distal parts.

Root Protection Area (RPA) – Layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree, shown in plan form in m².

Saprophyte – An organism which exists on dead plant material.

Scaffold branches - The main structural branches within the crown.

Services – Any above ground and piped and/or ducted underground infrastructure including water main, electricity supply, gas supply, fibre optic utilities, telecommunications cabling, storm and foul water drainage, including temporary storage for run-off, pumping stations, interceptors and other allied buried structures.

Shrinkable clay – Clay soil which alters in volume depending on moisture content. Property sited on shrinkable clay can suffer subsidence damage due to soil desiccation; this can be due to the water uptake of nearby vegetation, including trees.

Special engineering – design of a structure with the physiological requirements of trees as the priority.

Standard – Size of tree for planting, usually ranging from 2m to 3.5m in height.

Structure – Man-made object, such as a building, carriageway, path, wall, services, and built and excavated earthworks.

Transplant – (1) size of tree for planting, usually ranges from 0.2m to 0.9m in height (2) the relocation of a tree or shrub including a given portion of the root system.

Tree Constraints Plan (TCP) – Plan prepared by an arboriculturalist for the purposes of layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have on layouts through shade, dominance, etc.

Tree protection plan – scale drawing prepared by an arboriculturalist showing the finalised layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement (AMS), which can be shown graphically.

U.L.E – ‘Useful Life Expectancy’ is an estimate based on currently known factors of the possible remaining life of the tree as an asset.

Veteran tree – Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

Vigour - A general classification, as to the present and future potential growth and development of a tree. A comment regarding the health status of the tree specific to its species.

Water Demand - A generic classification of the water demand of specific species as outlined by the NHBC (National House Building Council).

Whip – Size of tree for planting, usually ranging from 1m to 1.75m in height.