Arboricultural ASSOCIATION
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(Tree Consultancy Services)

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Arboricultural Report

Including:

Tree Survey Data

&

Tree Constraints Plan (TCP)

To the British Standard 5837:2012
(Trees in relation to design, demolition and construction. Recommendations)

Date – 18th November 2022

Site – St Richard Gwyn Catholic High School,

Argae Lane, Barry, CF63 2FD

Project Reference – ArbTS_1531.1_St Richard Gwyn

Table of Contents

1.0 Introduction 3

2.0 The Tree Survey 3

3.0 The Trees 4

4.0 Tree Constraints Plan Information 4

5.0 Tree Protection Information 5

6.0 Conclusion 5

7.0 Qualifications & Further Information 6

8.0 Bibliography & Web Information 7

9.0 Appendix

- 1A Tree Survey Data
- 1B Detailed Tree Survey Data Summary
- 2 Tree Constraints Plan
- 3 Tree Survey Key
- 4 An Introduction to Tree Protection
- 5 Tree Photographs

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1.0 Introduction

1.1 The purpose of this report is to give an assessment as to the quality and constraints of the trees at St Richard Gwyn Catholic High School, Argae Lane, Barry, CF63 2FD. The findings of this survey will be used to inform future design proposals, to preserve and minimise damage to the important trees on or adjacent to this site.

1.2 This report identifies the quality of the trees on or adjacent to this site as categorised by the *British Standard 5837:2012, Trees in relation to design, demolition and construction - Recommendations*. The survey and findings as reported here represent an unbiased third party opinion offering professional advice as to the value of the trees on this site. A Tree Constraints Plan (TCP) has been drawn, as found in Appendix 2, to illustrate the constraints identified trees pose to the design of future development.

1.3 Arboricultural constraints within the surveyed site relate primarily to the preservation of trees recommended for retention. Identified trees must be protected during the construction phase through the employment of a combination of protective barriers, ground protection zones and tree safe construction methods, designed by a suitably qualified Arboriculturist.

1.4 The trees' root systems and the associated soil structure is often over looked during the construction process, and can be damaged or altered by compaction, causing major damage to the health of the tree. Generally, the entire root system of the tree is within the top 600mm, of soil where it can be easily damaged. A calculated area of ground around the tree should be protected for the duration of the onsite construction phase. In this report it is referred to as the Root Protection Area (RPA).

1.5 No Arboricultural Impact Assessment, Tree Protection Plan or Tree Protection Method Statement are included within this report. No assessment has been made regarding the suitability of the proposed development design within this report.

2.0 The Tree Survey

2.1 The tree survey was conducted by Stephen Lucocq *BSc (Hons), Tech Cert (ArborA) , M.Arbor.A* on 15th November 2022

2.2 Trees over 75mm were tagged where appropriate with numbered metal identification tags at around 2.0 metres above ground level.

2.3 All observations were made from the ground with the aid of an acoustic sounding hammer. No invasive decay detective instruments were used.

2.4 The survey was carried out in accordance to *British Standard 5837:2012, Trees in relation to design, demolition and construction - Recommendations.* This standard gives a systematic, consistent and transparent evaluation method to tree surveying.

2.5 The survey was conducted with the aid of a topographical survey.

2.6 **Preliminary management recommendations:** The survey has identified preliminary management recommendation for the trees on or adjacent to this site. Details regarding these identified operations are given in this report (See Appendix 1 - Tree Survey Data). Where work priority is stated to be H – High due to safety reasons, these operations should be carried out as soon as practically possible. Where work priority is stated to be M/H – medium/high or higher, these operations should be undertaken before commencement of any works on site.

2.7 **Limitations of the tree survey**: Whilst every effort is made to ensure an accurate assessment of the tree's condition is made during survey, no responsibility can be taken for resultant damage or injury occurred by a failing tree. The survey only gives a snap shot of what is visible and is not obscured on the day of the survey. The survey identifies trees of varying quality and their above ground/below ground constraints. This survey does not constitute a full tree condition/tree risk assessment of the site and this report is only valid for 12 months from the date of the tree survey.

3.0 The Trees

3.1 The full tree survey data can be found in Appendix 1A Tree Survey Data.

3.2 Tree Survey Summary Table (See Appendix 3 for BS5837 category definitions). (A more detailed Tree Survey Data Summary can be found in Appendix 1B)

BS5837:2012 Quality Category	Total Number of Individual Trees Surveyed	Total Number of Tree Groups Surveyed	Total Number of Tree Areas Surveyed	Total Number of Woodland Areas Surveyed	Total Number of Hedgerows Surveyed	Total
A (High - Most desirable for retention)	5	0	0	0	0	5
B (Moderate - Desirable for retention)	6	0	0	0	0	6
C (Low - Optional for retention)	8	5	0	0	0	13
U (Poor - Unsuitable for retention)	3	0	0	0	0	3
Total A,B,C,U	22	5	0	0	0	27

4.0 Tree Constraints Plan (TCP) Information

4.1 A Tree Constraints Plan (TCP) can be found at Appendix 2 of this report. An introduction to TCP can also be found at the start of Appendix 2. For further information and details regarding TCP please see the *British Standard 5837:2012, Trees in relation to design, demolition and construction – Recommendations.*

5.0 Tree Protection Information

5.1 No Arboricultural Impact Assessment, Tree Protection Plan or Tree Protection Method Statement are included within this report for the proposed development design. An introduction to Tree Protection can be found at Appendix 4.

6.0 Conclusion

6.1 This site has potential to accommodate development whilst retaining the trees of value. The significant trees on or adjacent to this site should be given due consideration in the development design process.

6.2 If the health and stability of the trees are maintained, and the following strategies implemented: a suitable development design; tree protection methods; Arboricultural site supervision and tree after care, the process of construction could be conducted with no adverse impact on the important trees upon or adjacent to this site.

7.0 Further Information & Qualifications

Stephen Lucocq has been involved in Arboriculture within South Wales for over twenty years. He has worked as an Arborist for many of these years and has a good working knowledge of the practical side of the profession. He has always taken an active interest in all areas of Arboriculture and kept up to date with current research and developments.

Qualifications

- First Class BSc (Hons) Degree – Combined Studies - Biology and IT
- Arboricultural Association Technicians Certificate – Level 4 - (Merit)
- PTI - Professional Tree Inspection (Lantra Awards)
- 2D Computer Aided Design (City and Guilds - Level 3)
- Quantified Tree Risk Assessment (QTRA) – Mike Ellison
- Visual Tree Assessment (VTA) – Mike Ellison
- Arboriculture and Bats (Lantra)
- Industrial Rope Access Trade Association (IRATA)
- Practical Arboriculture Qualifications (NPTC)

Membership

- Arboricultural Association Professional Member (*M.Arbor.A*)

8.0 Web Information & Bibliography

Web Information

- Arboricultural Association

  http://www.trees.org.uk/

- Cellular Confinement System

  GeoWeb - GreenFix

  CellWeb - Geosynthetics Cellweb

- Underground Utilities Installation

  http://www.njug.org.uk/

Bibliography

- British Standards 3998 (2010) Recommendations for Tree Work UK; British Standards Intuition
- British Standard 5837:2012, Trees in relation to design, demolition and construction - Recommendations UK; British Standards Intuition
- Coombes, A.J (1992) Trees London; Dorling Kindersley
- Lonsdale, D (1999) Principle of Tree Hazard Assessment and Management Edinburgh; Forestry Commission
- Mattheck, C (2007) Field Guide for Visual Tree Assessment Germany; Karlsruhe Research Centre
- Shigo, A.L (1991) Modern Arboriculture USA; Shigo and Trees, Association
- Sterry, P (2007) Collins Complete British Trees London; Collins
- Strouts, R.G (2000) Diagnosis of ill-health in trees Edinburgh; Forestry Commission
- Weber,K & Mattheck, C (2003) Manual of wood decay UK; Arboricultural Association

9.0 Appendix 1A -Tree Survey Data

Tree ID #	Tree Species	Age	Stems	Stem Diam (mm)	Cat	Height + (Lower Branch Height)	Nrth	Est	Sth	Wst	Phys Cond	Struc Cond	Est. Remain Contrib	Comments		Preliminary Management Recommendations		Work Priority	RPR (m)	RPA (m2)
G1	Crataegus monogyna (Hawthorn),Corylus avellana (Hazel),Fruit tree spp (Fruit tree spp),Sambucus nigra (Elder),Ulmus procera (English Elm),Prunus spinosa (Blackthorn)	M	1	250	C2	5(0)	6	6	6	6	G/F	F	20+		overgrown hedgerow				3	28.28
G2	Acer pseudoplatanus (Sycamore),Salix fragilis (Crack Willow)	EM	1	250	C2	9(0)	5	5	5	5	F	F	10+		boundary group of scrub and small trees, appears to be past coppiced, large gaps noted with brambles				3	28.28
G13	Acer pseudoplatanus (Sycamore)	EM	1	200	C2	9(3)	3	3	3	3	F	F	10+		small multistemmed tree group				2.4	18.1
G17	Betula pendula (Silver Birch)	EM	1	150	C2	4(2)	2	2	2	2	F	F	10+						1.8	10.18
G26	Acer pseudoplatanus (Sycamore)	M	1	150	C2	7(0)	3	3	3	3	F	F	10+		boundary edge of trees of poor form growing through fence line				1.8	10.18
T3	Betula pendula (Silver Birch)	M	1	420	B2	12(2)	4	4	5	4	G/F	G/F	10+		tree of good form				5.04	79.81
T4	Acer pseudoplatanus (Sycamore)	M	2	600	B2	13(2)	8	8	8	8	G/F	G/F	20+		twin stemmed tree of fair to good form				10.2	326.3
T5	Acer platanoides (Norway Maple)	M	1	800	A2	13(2)	9	9	9	9	G/F	G/F	20+		prominent tree of good form, some internal dead branches noted		removing deadwood	H/M	9.6	289.6
T6	Crataegus monogyna (Hawthorn)	M	1	150	C2	4(2)	2	2	2	2	F	F	10+						1.8	10.18
T7	Carpinus betulus (Hornbeam)	M	1	300	C2	9(3)	3	4	3	2	F	F	10+						3.6	40.72
T8	Sorbus aucuparia (Rowan)	M	1	150	C2	9(3)	2	2	2	2	F	F	10+						1.8	10.18
T9	Fraxinus excelsior (Ash)	M	1	400	U	5(2)	3	3	3	3	F/P	F/P	<10						4.8	72.39
T10	Fagus sylvatica (Beech)	M	1	650	B2	12(4)	7	7	7	7	G/F	N/A	20+	Surrounding vegetation prevented close inspection of the tree therefore all observations and measurements are estimated.					7.8	191.2
T11	Tilia X europaea (Common Lime)	M	1	700	A2	13(0)	9	9	7	7	G/F	G/F	40+		tree of good form				8.4	221.7
T12	Carpinus betulus (Hornbeam)	M	1	530	A2	13(0)	7	5	7	7	G/F	G/F	40+		tree of good form				6.36	127.1

Tree ID #	Tree Species	Age	Stems	Stem Diam (mm)	Cat	Height + (Lower Branch Height)	Nrth	Est	Sth	Wst	Phys Cond	Struc Cond	Est. Remain Contrib	Comments		Preliminary Management Recommendations		Work Priority	RPR (m)	RPA (m2)
T14	Acer platanoides (Norway Maple)	M	1	400	C2	10(2)	4	3	4	5	F	F	10+		tree of average form, crown damaged noted				4.8	72.39
T15	Aesculus hippocastanum (Horse Chestnut)	M	1	550	B2	12(2)	7	7	7	5	G/F	G/F	20+		tree of fair to good form				6.6	136.9
T16	Fraxinus excelsior (Ash)	M	1	400	U	5(2)	3	3	3	3	F/P	F/P	<10						4.8	72.39
T18	Tilia X europaea (Common Lime)	M	1	650	A2	13(0)	7	7	7	7	G/F	G/F	40+	Ivy on tree.	tree of good form				7.8	191.2
T19	Acer pseudoplatanus (Sycamore)	M	1	750	B2	14(3)	7	6	7	6	G/F	N/A	20+	Surrounding vegetation prevented close inspection of the tree therefore all observations and measurements are estimated.	heavy ivy cover of trunk				9	254.5
T20	Acer pseudoplatanus (Sycamore)	M	1	350	C2	10(3)	7	5	5	5	F	F	10+		multistemmed boundary tree				4.2	55.42
T21	Acer pseudoplatanus (Sycamore)	M	1	350	C2	10(3)	5	5	5	5	F	F	10+		multistemmed boundary tree				4.2	55.42
T22	Acer pseudoplatanus (Sycamore)	M	1	350	U	10(3)	2	2	5	5	F/P	F/P	<10		twin stem boundary tree, suppressed in form, large area of dysfunction noted at union		fell	H/M	4.2	55.42
T23	Aesculus hippocastanum (Horse Chestnut)	M	1	650	B2	12(2)	7	8	6	5	G/F	G/F	20+		tree of fair to good form, occluded cavity				7.8	191.2
T24	Acer pseudoplatanus (Sycamore)	M	1	350	C2	10(3)	5	5	5	5	F	F	10+	Ivy on tree.	multistemmed boundary tree				4.2	55.42
T25	Acer pseudoplatanus (Sycamore)	M	1	400	C2	10(3)	5	5	5	5	F	F	10+		multistemmed boundary tree, hawthorn adjacent tree				4.8	72.39
T27	Tilia X europaea (Common Lime)	M	1	670	A2	13(0)	9	9	7	7	G/F	G/F	40+		tree of good form				8.04	203.1

9.0 Appendix 1B – Detailed Tree Survey Data Summary

(Please see Appendix 3 - Tree Survey Key)

Field Usage Results.		
Total Records: 27		
Type	Count	% of Total
T	22	81.5
G	5	18.5
Tree Species	Count	% of Total
Acer pseudoplatanus (Sycamore)	9	33.3
Aesculus hippocastanum (Horse Chestnut)	2	7.4
Tilia X europaea (Common Lime)	3	11.1
Betula pendula (Silver Birch)	2	7.4
Acer platanoides (Norway Maple)	2	7.4
Crataegus monogyna (Hawthorn)	1	3.7
Carpinus betulus (Hornbeam)	2	7.4
Sorbus aucuparia (Rowan)	1	3.7
Fraxinus excelsior (Ash)	2	7.4
Fagus sylvatica (Beech)	1	3.7
Average Stem Diameter	Count	% of Total
<250	5	18.5
<500	12	44.4
<750	7	25.9
<1000	3	11.1
Cat	Count	% of Total
A2	5	18.5
B2	6	22.2
C2	13	48.1
U	3	11.1
Age	Count	% of Total
EM	3	11.1
M	24	88.9

Height	Count	% of Total
<5	2	7.4
<10	8	29.6
<15	17	63
Phy Cond	Count	% of Total
G/F	12	44.4
F	12	44.4
F/P	3	11.1
Stuc Cond	Count	% of Total
G/F	9	33.3
F	13	48.1
F/P	3	11.1
N/A	2	7.4
Est. Remain Contrib	Count	% of Total
<10	3	11.1
10+	13	48.1
20+	7	25.9
40+	4	14.8
RPR	Count	% of Total

9.0 Appendix 2 - Tree Constraints Plan

An introduction to the Tree Constraints Plan (TCP)

Trees which have been identified to be retained should be treated as constraints to the design of future development. A Tree Constraints Plan has been drawn and can be found over leaf.

- **Tree Quality** - The TCP highlights the above and below ground constraint each tree poses to the design of future development schemes. Further to this the BS5837 tree quality category (A - High, B - Moderate, C - Low and U- Unsuitable for retention) are coloured coded as solid circles at the centre of the trees' position.

- **Root Protection Area** – A magenta circle on the TCP sets out root protection area (RPA). Within this area no construction work, alteration in ground levels or site traffic (machinery or persons) should occur. This prevents damage to tree roots and soil compaction. (Where possible an Arboriculturist can design suitable tree protection methods to facilitate construction work/site traffic within these areas).

- **Tree Canopy -** The jagged green circle/oval on the TCP sets out the above ground constraints of tree canopy spread. Within this area no construction work or site traffic (machinery or persons) should occur if the tree is to be retained. This prevents damage to the tree branches and trunk. (Where possible an Arboriculturist can design suitable tree protection methods to facilitate construction work/site traffic within these areas).

- **Tree Shading** – Shade from the retained trees should be considered in the development design. The shade cast, depending on the trees height and width, will be from a North West to East pattern through the main part of the day.

- **Tree Future growth** - Within future development design, consideration should also be given to the ultimate height and extent of the canopy spread of all trees within the site identified to be retained.

Tree Constraints Plan

Site - St Richard Gwyn

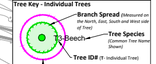
Project Ref - 1531.1

Scale 1:1000 @ A2

KEY **BS 5837:2012 Tree Quality** (Colour Coded) (Individual Tree)

- **Category A (High)** (*Highly desirable for retention*)
- **Category B (Moderate)** (*Desirable for retention*)
- **Category C (Low)** (*Optional for retention*)
- **Category U (Poor)** (*Unsuitable for retention*)

Tree Key - Individual Trees



Root Protection Area (RPA) *(A layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.)*

Tree Key - Group/Area/Woodland/Hedgerow

Shade Pattern - shade pattern not shown on plan *(early morning shade starting North West through to evening shade to the East)*

Definitions of BS5837:2012 Categories for Trees, Woodlands and Hedgerows (Colour Coded):

A - Those of high quality with an estimated remaining life expectancy of at least 40 years. (*Highly desirable for retention*)

B - Those of moderate quality with an estimated remaining life expectancy of at least 20 years. (*Desirable for retention*)

C - Those of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm. (*Optional for retention*)

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. (*Unsuitable for retention unless provides high conservation value*)

Please Note:
Barriers and Ground Protection must be designed by an arboriculturist, installed before materials or machinery is bought onto site and before any demolition, development or stripping of soil commences. Once erected, barriers and ground protection should be regarded as sacrosanct, and should not be removed or altered without prior recommendation by an Arboriculturist and approval of the Local Planning Authority (LPA).

Tree Constraints Plan

Site - St Richard Gwyn

Project Ref - 1531.1

Scale 1:1000 @ A2

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KEY **BS 5837:2012 Tree Quality** (Colour Coded) (Individual Tree)

- **Category A (High)** (*Highly desirable for retention*)
- **Category B (Moderate)** (*Desirable for retention*)
- **Category C (Low)** (*Optional for retention*)
- **Category U (Poor)** (*Unsuitable for retention*)

Tree Key - Individual Trees

Root Protection Area (RPA) (*A layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.*)

Tree Key - Group/Area/Woodland/Hedgerow

Shade Pattern - shade pattern not shown on plan (*Early morning shade starting North West through to evening shade to the East*)

Definitions of BS5837:2012 Categories for Trees, Woodlands and Hedgerows (Colour Coded):

A - Those of high quality with an estimated remaining life expectancy of at least 40 years. (*Highly desirable for retention*)

B - Those of moderate quality with an estimated remaining life expectancy of at least 20 years. (*Desirable for retention*)

C - Those of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm. (*Optional for retention*)

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. (*Unsuitable for retention unless provides high conservation value*)

Please Note:
Barriers and Ground Protection must be designed by an arboriculturist, installed before materials or machinery is bought onto site and before any demolition, development or stripping of soil commences. Once erected, barriers and ground protection should be regarded as sacrosanct, and should not be removed or altered without prior recommendation by an Arboriculturist and approval of the Local Planning Authority (LPA).

9.0 Appendix 3 - Tree Survey Data Key

- **Tree ID # -** Identifies the location of individual trees (T-ID Number), Groups of trees (G-ID Number), Area of trees (A-ID Number), Hedgerow (H-ID Number), Woodland (W-ID Number), Row of trees (R-ID Number) and tree Stumps (S-ID Number) on the accompanying plan. *(Please note: A group of trees here refers to two or more standing trees that form a visual whole, whereas an area of trees refers to dispersed individual trees standing within the site)*

- **Tree Species -** Scientific names and common tree name in brackets are generally shown.

- **Age**
  - (Y) Young – Less than 1/3 of life completed
  - (SM) Middle Aged - 1/3 - 2/3 of life completed
  - (EM) Early Mature – Just entering Maturity
  - (M) Mature – more than 2/3 of life completed
  - (OM) Over Mature - more than 3/3 of life completed and declining
  - (V) Veteran - (v) Veteran – Veteran trees have no precise definition but are trees considered to be of biological aesthetic or ecological value because of their age

- **Stems –** Number of tree stems used to calculate the RPR/RPA

- **Stem Diam** (mm) - Diameter of tree stem measured in millimetres for single stem trees or average stem diameter calculated for multi-stemmed trees as detailed in section 4.6 & Annex C of the British Standard 5837:2012, Trees in relation to design, demolition and construction - Recommendations. The height above ground level where the stem measurement was taken will be shown if not measured at 1.5 metres above ground level. *(Please note: that the stem diameter of certain trees will have to be estimated due to difficulties in taking measurements or for trees with a large number of stems)*

- **Cat** – Tree Quality Category - British Standard 5837:2012 A, B, C, U + 1, 2, 3

  Based on BS5837:2012 categories A, B, C, U provides the basis of prioritising trees for retention:

  - A – Those of high quality with an estimated remaining life expectancy of at least 40 years. (*Most desirable for retention*)
  - B - Those of moderate quality with an estimated remaining life expectancy of at least 20 years. (*Desirable for retention*)
  - C – Those of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm. (*Optional for retention*)
  - 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. (*Unsuitable for retention unless provides high conservation value*)

Retention Criteria Subcategories: Used for identifying subcategories

E.g. A2 = A high quality tree with high landscape qualities (further details can be found in British Standard 5837:2012, Trees in relation to design, demolition and construction - Recommendations UK; British Standards Intuition)

- 1 – Mainly Arboricultural qualities
- 2 – Mainly landscape qualities
- 3 – Mainly cultural values, including conservation

- **Height + (Lower Branch Height) -** Tree height in metres and in brackets height in metres of the crown (tree branches) clearance at its lowest point above adjacent ground levels.

- **Nrth, Est, Sth, Wst** - Crown Spread (Metres) -Tree branch spread in metres measured in four directions (North, East, South, West) from the trunk.

- **Phys Cond -** Physiological Condition Indicating the health of the tree -

  - (G) Good
  - (F) Fair
  - (P) Poor
  - (D) Dead
  - (N/A) Not Applicable – unable to fully inspect tree due to surrounding vegetation or access issues.

- **Struc Cond –** Structural Condition indicting the structural integrity of the tree -

  - (G) Good – No, or remediable physical defects or decay
  - (F) Fair - Physical non-remediable defects or decay present, not presenting imminent danger but should be monitored
  - (P) Poor - physical non-remediable defects or decay present, tree liable to imminent collapse or loss of major limbs.
  - (D) Dead
  - (N/A) Not Applicable – unable to fully inspect tree due to surrounding vegetation or access issues.

- **Est. Remain Contrib** - (<10, 10+, 20+, 40+)

  The trees estimated remaining contribution in years, recorded as:

  - <10 – less than 10 years
  - 10+ – at least 10 years
  - 20+ – at least 20 years
  - 40+ – at least 40 years

- **Comments –** Additional Comments if required

- **Preliminary Management Recommendations –** Work Recommendations, including further investigation of suspected defects that require more detailed assessment and pose potential for wildlife habitat.

- **Work Priority -** Work Priority -This gives a work priority rating of preliminary management for each tree.

    - H - High – Urgent work to be carried out as soon as practicable due to safety reasons (Within 14 days).
    - H/M - High- Medium – Work to be carried out within 6 months/or before construction phase begins
    - M - Medium – Work to be carried out in 12 months
    - L - Low – After consideration/Re-inspect in 18-24 months
    - Blank – No work required.

- **RPR –** Root protection radius / **RPA -** Root Protection Area **-** Is a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. RPR is a circular area measured as a radius in metres from the centre of the tree or RPA is an area in metres squared. Where required this area may be changed in shape but not reduced in area whilst providing adequate protection of the tree's rooting system.

9.0 Appendix 4 – An Introduction to Tree Protection

For the purpose of this report an introduction is given to tree protection. If required an Arboricultural Impact Assessment, Tree Protection Plan and Tree Protection Methods Statement can be provided for the finalised development design.

Tree protection methods must be considered and designed by an Arboriculturist. These should then be implemented BEFORE any machinery or materials are bought onto site and before any demolition, development or stripping of soil commences. The Root Protection Area (RPA) (cyan circles/lines) indicated on the Tree Constraints Plan must be set out and the protective barriers and ground protection installed accordingly for retained trees. The protective barriers and ground protection areas shall be regarded as sacrosanct, and shall not be removed or altered without prior recommendation by an Arboriculturist and approval of the LPA.

The areas protected by barrier fencing and ground protection shall be subject to the following restrictions:

- Existing soil levels within the protected areas shall not be altered.
- No excavation of any kind shall take place within the protected areas.
- The protected areas shall not be used for storage of any kind.
- No vehicles or machinery shall be allowed into the areas protected by fencing.
- Should the developer require the above restrictions to be breached for unforeseen reasons, an appropriate method of works must be agreed with the Local Planning Authority prior to any works taking place within the protected areas.

Additional precautions outside protected barrier areas and ground protection:

- All underground services should be installed following NJUG Volume 4 Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees. The full document is available at http://www.njug.org.uk/.
- Building materials and fuels such as oil, bitumen or cement should not be stacked or discharged within 10 metres of the trees stem.
- Fires will not be lit beneath any tree or in a place where flames could extend to within 10 metres of the outer canopy of any tree.
- Trees that are to be retained and protected should not be used as anchorage for services or equipment.
- The use of cranes and large machinery on site should be planned and care taken not to damage the tree during the process.

Visits by an Arboriculturist during the construction process should be conducted to ensure all of the above are being strictly adhered too.

9.0 Appendix 5 – Tree Photographs

Tree ID#T3

Tree ID#T5

Tree ID#T9

Tree ID#T12

Tree ID#T11

Tree ID#T10, T12, T16, T15

Tree ID#T6

Tree ID#G2

Tree ID#G1

Tree ID#T22, T21, T20

Tree ID#T25, T24, T23

Tree ID#T27

Appendix