



THE TREE AND  
WOODLAND COMPANY

## The Observatory

Woolwich Royal Artillery Barracks

Defence Infrastructure Organisation (DIO)

Arboricultural Appraisal Report

October 2022

TWC1357-R-002

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## **1.0 Introduction**

### Background

- 1.1 We are instructed by Sweco UK Ltd, on behalf of the Defence Infrastructure Organisation (DIO), to undertake an Arboricultural survey and assessment at The Observatory, which is located at the Woolwich Royal Artillery Barracks in the London Borough of Greenwich. The assessment has been carried out in accordance with BS5837:2012 'Trees in relation to design, demolition & construction - Recommendations'.
- 1.2 The assessment has been produced to inform conceptual design and operational planning by highlighting the above and below ground constraints in the context of proposed development. This report provides arboricultural detail suitable to support a pre-application or outline planning application.

### Site Description

- 1.3 The Observatory site is within the area of Green Hill Woolwich, which is located to the west of the Royal Artillery Barracks. The Observatory, also named the Magnetic Office, is a Grade II listed building. It is centred on OS grid reference: TQ42787508
- 1.4 The site is accessed by a driveway from Green Hill road to the south with associated turning circle and parking area adjacent to the building. Mature trees stand around the fringes of the building and there are open areas of grass to the south and east. The site has an elevated position and the land slopes to the north, east and west. Green Hill road runs along the lower slope of the site's western boundary and several properties bound the site's northern boundary.
- 1.5 There are several mature trees around the immediate landscape of the building and the principal trees features include a Beech and several Holm Oaks around the driveway/car park, two prominent London Planes to the east, several Sycamore to the north and a row of Lime lining the western edge of the site.

## 2.0 Survey Methodology

- 2.1 The tree survey and the report have been completed by Richard O'Shea, who holds the formal qualification FdSc in Arboriculture and the LANTRA Certificate in Professional Tree Inspection. Richard is also a Professional Member of the Arboricultural Association.
- 2.2 The trees have been assessed using the current recommendations, as detailed in British Standard 5837:2012, in order to arrive at a Quality Category for each individual tree, group of trees or woodland. For full details of the assessment criteria see 'Table 1. Cascade chart for tree quality assessment' of BS5837:2012, shown in Appendix 2.
- 2.3 A Root Protection Area (RPA) has been assigned to each tree, which is calculated as 12 times the diameter of the tree trunk measured at 1.5 metres above ground level. The RPA of all trees, groups, woods have been plotted on the Tree Constraints Plan in addition to stem locations, canopy spreads and quality categories (attached as Appendix 3).
- 2.4 Although the RPA attempts to identify the area of each tree's root system which should be protected, the simplistic circles do not take account of constraints such as structures or roads, or factors such as topography, soil structure, tree health etc., which may have restricted or influenced root development. Circular RPA's are considered to provide a reasonable guide to the extent of the likely rooting areas which should ideally be protected.
- 2.5 All surveyed trees and groups have been given an identification reference T1-T30 and G1-G2. All collected survey data is presented in the survey schedule which forms Appendix 1 to this report.
- 2.6 Tree positions were approximately plotted on to a digital Ordnance Survey plan using a handheld GPS device along with on-site observations and measurements. The location of trees and groups recorded on the Tree Constraints Plan (Appendix 3) must therefore be treated as approximate at this stage and a Topographical survey will be required to record accurate tree positions for a detailed design stage and the tree constraints plan updated accordingly. The presence of existing tree tags has been used to aide identification on site and are referenced in the tree schedule. Individual trees with a stem diameter below 75mm have not been recorded during the survey.
- 2.7 All tree features have been surveyed to record species, age class, diameter at breast height (dbh), height, crown spread, condition, estimated remaining contribution, recommendations, Quality Category and RPA.
- 2.8 All trees surveyed have been inspected from ground level only. Although the survey was not a hazard survey, where there was a concern for the potential risk of harm to people or property due to a defect on a particular tree, this will be highlighted in the survey schedule. Trees are dynamic living organisms, whose health and condition can be subject to rapid change, depending on a number of external and internal factors. The conclusions and recommendations contained in this report relate to the trees at the time of inspection.
- 2.9 A tree constraints check was undertaken with the Local Planning Authority to establish the presence of Tree Preservation Orders, Conservation Areas, or other statutory designations or restrictions to tree works either on or adjacent to the site. Further detail is presented in Section 5.

### 3.0 Tree Population and Quality Categorisation Guidance

#### Tree Categorisation Guidance

- 3.1 Trees form a material consideration in the planning process. The tree categorisation identifies the quality and value of the existing tree stock; however, it is not meant to be interpreted rigidly, and therefore forms the basis for an informed judgement on tree retention and removal.
- 3.2 Foremost consideration should be given to the retention of Category A and B trees (high and moderate quality) in relation to any new development. These trees are largely irreplaceable in the short to mid-term, and the requirement to remove them must be justified by sound design rationale.
- 3.3 **Category A** trees/groups are of high value by virtue of their large size, mature age, good condition, ecological importance, landscape significance and/or potential long-term contribution. Trees are downgraded to **B Category** if they are in impaired condition, have a reduced life expectancy or lack the special quality necessary to merit Category A. These trees/groups will still afford arboricultural, landscape or ecological importance.
- 3.4 **Category C** trees/groups that are of low value due to their young age, small size, impaired condition, limited life expectancy/landscape significance and/or conservation value. These tree features should not represent a significant constraint to a design brief; nevertheless, they should not be considered totally unsuitable for incorporation within proposals. In many cases, low quality trees can be suitably mitigated with replacement tree planting.
- 3.5 **Category U** trees/groups are unsuitable for retention due to their poor health and reduced life expectancy and should be removed prior to development. U Category trees can sometimes be retained where they offer particular conservation value to the site.
- 3.6 Trees under the ownership of third parties but within influencing distance of the site may present a constraint to development activities in terms of overhanging branches and encroaching roots. These trees must be considered during design preparation and must be retained and protected.

#### Tree Population

- 3.7 A total of 30 trees and 2 Groups have been recorded. The tree population is summarised by each category in the following sections 3.8-3.17 and a breakdown of the numbers of trees in each category is shown in the Table 1 (overleaf).
- 3.8 The tree population is mature and provides valuable landscape and conservation benefits to the site and surroundings. The immediate surroundings include several Holm Oaks that are dominant at the building frontage and fringes of the car park due to their size, age and evergreen character. A mature Copper Beech and mature Lime complement the Holm oaks at the frontage and two notable London Plane to the east of the site are notable specimens. The northern part of the site includes a cluster of mature Sycamore and along the western boundary are a mix of Sycamore, Holm Oak and a formal row of Lime along the edge of Green Hill Road.

Category A – High Value (9 trees)

- 3.9 The high value trees include 1 Copper Beech, 1 Holm oak, 2 London Planes and 5 Limes. The Copper Beech (T3) has an unbalanced crown due to competition from an adjacent tree but is in good condition and provides significant arboricultural value to the setting. A mature Holm Oak (T7) is located within the turning circle island of the driveway car park. It displays several defects such as cavities, pruning wounds and branch failures and is overall in fair condition, but it affords significant character and prominence due to its location. A mature Lime (T10) stands to the east of the building and displays good form and condition.
- 3.10 Two notable London Plane (T11, T12) are situated to the east of the building in open grassland; they are prominent trees due to their size and stature and make a significant contribution to the landscape amenity of the locality.
- 3.11 Four mature Limes, T26-T29 form a linear feature along the western boundary of the site adjacent Green Hill road. They have been pollarded in the past with associated regeneration, and have some crown dieback and deadwood, but they are generally in good/fair condition and assessed as high value in respect of their location and collective form.

Category B – Moderate Value (13 trees, 1 group)

- 3.12 There are 3 Holm Oaks (T4, T8, T9) located around the edges of the car park/driveway that have impaired condition due to old failures, wounds and cavities but are assessed as Category B as they provide moderate arboricultural and landscape value to the site and have the potential to contribute for many more years. One Holm oak is located amongst several Sycamore to the north of the site (T17) and 2 others (T22, T23) are located to the south-west of the building. They have leaning stems and biased crowns but are generally in fair condition and assessed as moderate value.
- 3.13 Sycamores dominate the northern area of the site and are mainly situated on the mid to lower parts of the sloping ground. They are middle-mature to mature trees, generally in good condition and are of moderate quality and value.
- 3.14 A group of Field maple stand to the north east of the site; they have varied form but are generally in good/fair condition and are assessed as a moderate value feature.

Category C – Low Value (6 trees, 1 group)

- 3.15 Two Holm oak (T2, T25), 2 Sycamore (T5, T13), 1 Holly (T21) and 1 Cherry (T30) have been assessed as low value based on their early-mature age, impaired condition and limited quality.
- 3.16 Group G1 comprises early-mature Field maple that form a small group to the east of the driveway access. They are generally in fair condition and are assessed to be of low arboricultural and landscape value.

Category U – Unsuitable for retention (2 trees)

- 3.17 Two small trees are in poor condition and are recommended for removal. They include 1 Hawthorn (T1) and 1 Elm (T24) with crown dieback and poor form.

**Table 1: Quality Categorisations**

Quality Category	Trees	Groups	Totals
<b>A</b> (trees of high quality with an estimated remaining life expectancy of at least 40 years)	T3, T7, T10, T11, T12, T26, T27, T28, T29	-	<b>9</b>
<b>B</b> (trees of moderate quality with an estimated remaining life expectancy of at least 20 years)	T4, T6, T8, T9, T14, T15, T16, T17, T18, T19, T20, T22, T23	G2	<b>14</b>
<b>C</b> (trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm)	T2, T5, T13, T21, T25, T30	G1	<b>7</b>
<b>U</b> (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)	T1, T24	-	<b>2</b>
<b>Totals</b>	<b><u>30</u></b>	<b><u>2</u></b>	<b><u>32</u></b>

## **4.0 Guidance and Recommendations**

### Arboricultural Constraints and Opportunities

- 4.1 Category A and B tree features are the major component of the tree population and are important arboricultural, landscape and conservation assets to the site and surroundings.
- 4.2 These high and moderate value trees are located around the building, car parking area and surrounding landscape and form significant constraint in respect of their large canopies and rooting areas. These trees should be conserved and protected as part of any future proposals.
- 4.3 The Category C and Category U trees are of low/poor quality and should not pose a constraint.
- 4.4 Many additional factors will ultimately determine any future proposals on site, but any tree impacts must be assessed in detail during the planning and design phase, proposed tree removal must be soundly justified, and appropriate levels of mitigation must be implemented to offset any tree loss. Appropriate tree protection and management will also be required to minimise unnecessary impacts during development and maximise the treescape potential post-development.

### Tree Work

- 4.5 All tree work recommendations are based on the existing site use and are detailed in the Tree Survey Schedule (Appendix 1). Tree works relating to a proposed layout and associated development phases will be considered and specified within an Arboricultural Impact Assessment for any detailed design stage.
- 4.6 All tree works should be carried out by suitably qualified and experienced contractors and should conform to guidelines set out in British Standard 3998: 2010 'Tree work – Recommendations'.
- 4.7 Following site development, regular inspections of retained trees, should be undertaken by a qualified Arboriculturalist.

### General Guidance

#### *Root Protection Areas*

- 4.8 An RPA has been assigned to each tree, calculated using the stem diameter at 1.5 metres above ground level. The RPA for groups/woods have been calculated in the same way using the stem diameter but is based on the largest trees within a group or an average, whichever is deemed more appropriate.
- 4.9 The RPA represents the minimum area around each tree that must be left undisturbed to ensure their survival. This will restrict the space available for development. The RPA and/or crown spread of individual trees and groups will generally form a Construction Exclusion Zone (CEZ); where construction is necessary within the CEZ of trees selected for retention, sensitive and controlled working procedures must be implemented.



- 4.10 The morphology of roots is influenced by past and present site conditions (the presence of roads, structures and underground services), soil type, topography and drainage. On this site many trees are growing in open ground, but several are growing close to hardstanding which may affect their rooting environment. The RPA's have been shown as circles on the tree constraints plan to provide a suitable guide to the size and extent of rooting areas.

#### *Ground Level Changes*

- 4.11 A rise or reduction in soil level can have major implications on the longevity and health of the trees. Minor changes (up to 100mm) can be tolerated in some cases, but is heavily dependent on tree species, condition and growing environment.
- 4.12 Existing ground levels within RPAs should be respected as far as is reasonably practicable. The advice of the project arboriculturalist should be sought if level changes are required.

#### *Structural Stand-off and Light issues*

- 4.13 A structural standoff will need to be considered for retained trees, the precise detail of this should be tailored to the proposed design layout. The function of such a 'development standoff' is to ensure adequate space is afforded for future growth, ultimate height and crown spread of retained trees, thus helping to promote their long-term survival.
- 4.14 The issue of light attenuation in respect of trees will require due consideration in the design layout; where trees are retained, the orientation of windows will need to take account of shade cast by trees.

#### *Tree Protection and Construction Exclusion Zones*

- 4.15 Temporary protective fencing will be required to demarcate a Construction Exclusion Zone (CEZ) around retained trees to ensure their successful retention. The CEZ acts to protect both tree roots and branches and should be suitably protected with appropriate temporary fencing for the duration of the demolition and construction phases of the development; exact specifications for this will depend on the nature of the proposed development.
- 4.16 The standard specification for protection fencing will comprise 2m high Hears® type galvanized weld mesh panels, which must be secured to the ground and appropriately braced to prevent lateral movement. Precise recommendations can be defined in site-specific tree protection plans drawn up by the project arboriculturalist as part of an Arboricultural Impact Assessment (AIA).

#### *Pests and Diseases*

- 4.17 Tree pests and diseases are part of a balanced ecosystem and dead, dying and diseased wood is a natural process providing an important contribution to habitat biodiversity. However, in recent years there have been an increasing number of new and serious pests and diseases affecting tree populations across the UK and regular monitoring is essential to check for their presence. Ash dieback (*Chalara fraxinea*), Oak Processionary Moth, Horse Chestnut Bleeding Canker and Phytophthora, are now widely established.
- 4.18 These diseases can kill or weaken trees quite rapidly and it is important to monitor them in order to inform future management decisions. It will also be important in relation to public safety where dead or dying trees are in proximity to roads, footpaths and property.

*Further Assessments/Consultation*

- 4.19 Information in this report is presented to allow informed decisions to be made regarding tree retention and removal during design inception. The project arboriculturalist should be consulted throughout the conceptual design and operational planning stages to provide technical input and ensure the aspirations of the masterplan can be achieved. The Local Authority Tree Officer should also be consulted with regard to potential effects to trees and future management strategies.
- 4.20 At detailed planning and design stages, it will be necessary to carry out an Arboricultural Implications Assessment (AIA) which will assess the specific implications of the proposed development scheme on existing trees and provide detail on appropriate protection measures and mitigation recommendations.
- 4.21 An Arboricultural Method Statement (AMS) may also be required where construction activities are proposed near to, or within, the RPA or canopy of retained trees. The purpose of an AMS is to demonstrate that the proposed operations can be undertaken with minimal risk of adverse impact on trees to be retained. It will detail action specific methods for construction activities, phasing and alignment of protection fencing and make the provision for onsite supervision during the works by the project arboriculturalist.
- 4.22 Following site development, regular inspections (annual or biennial) of retained trees, should be undertaken by a qualified Arboriculturalist.

*Mitigation*

- 4.23 In respect of trees, a sustainable development will be one whereby the total number, value or function provided by trees is maintained or increased or where the long-term prospects of the existing tree stock can be substantially improved.
- 4.24 To maintain a healthy tree population resilient to pests and diseases and climate pressures, it will be important to have a diverse age and species mix that can maintain and increase overall canopy cover in the area. Key principles will include, the right tree species selection, providing beneficial conditions for healthy tree establishment and regular and appropriate management.
- 4.25 New planting should include mixed tree species of varied form, appearance and ultimate size, and plant selection and their planting locations must be well-considered in relation to proposals and site conditions.

## 5.0 Statutory Obligations

- 5.1 Works to trees which are covered by Tree Preservation Orders [TPOs] or are within a Conservation Area [CA] require permission or consent from the Local Planning Authority [LPA]. It is necessary to gain confirmation from the LPA of any TPOs or CAs on the site, and to follow the necessary application procedure if tree surgery or felling is required in respect of protected trees. Full planning consent will however override the need for a separate application, providing that details of all tree works are included in the submission and subsequently approved by the local authority.
- 5.2 The Royal Borough of Greenwich Council have confirmed that the site is situated within Woolwich Common Conservation Area and all trees over 7.5cm in diameter are protected by controls requiring permission from the council to undertake any tree works. The Council's Tree Preservation Order database lists trees within Woolwich Common and Woolwich Barracks as having protected trees present, but it does not provide specific information on the particular tree features. The Council should be contacted to obtain any specific TPO information and documents to confirm if any trees are also protected by a TPO.
- 5.3 The Forestry Commission should be informed if more than 5 cubic metres of timber in any one calendar quarter is being felled however, a felling licence is not required for felling to immediately facilitate a development authorised by full planning permission. Pre-emptive or enabling works undertaken prior to obtaining planning permission may require a felling licence.
- 5.4 Trees and woodland provide valuable habitat for nesting birds and roosting bats and it is a criminal offence under normal circumstances to disturb or destroy – whether intentional or unintentional – the nesting or roost sites of bats. They are afforded protection under the 'Wildlife & Countryside Act 1981' and the 'Conservation of Species and Habitats Regulations 2017'. Therefore, avoid carrying out significant tree works during the bird nesting season [1st March to 31st July] and ensure that trees are professionally surveyed for signs of bat roosts and/or bat activity before starting any tree work. Further advice should be sought from an Ecologist.
- 5.5 The National Planning Policy Framework (NPPF) 2021 states that heritage assets should be conserved in a manner appropriate to their significance and also assumes protection of all ancient woodland and veteran trees unless it can be clearly demonstrated that the need of, or benefits of, development outweigh the loss. In this respect ancient woodland is defined as an area which has been wooded continuously since at least 1600 AD and a veteran as a tree of exceptional value for wildlife, in the landscape, or culturally because of its great age, size or condition. There is no ancient woodland or veteran trees within the site.

## References

British Standard Institute (BSI) (2012). *BS 5837:2012 Trees in Relation to Design Demolition and Construction-Recommendations*. BSI, London.

British Standard Institute (BSI) (2010). *BS 3998:2010 Recommendation for Tree Works*. BSI, London.

British Standard Institute (BSI) (2014). *BS 8545:2014 Trees: from nursery to independence in the landscape - Recommendations*. BSI, London.

Department for Communities and Local Government (2014). *Planning Practice Guidance on Tree Preservation Orders and trees in conservation areas*.

Lonsdale, D. (1999). *Research for Amenity Trees No.7: Principles of Tree Hazard Assessment and Management*. HMSO

Ministry of Housing, Communities & Local Government, (2021). *The National Planning Policy Framework (NPPF)*.

Mattheck and Beloer (1994). HMSO London. *Research for Amenity Trees No 4; The Body Language of Trees*.

Town and Country Planning Act 1990 (as amended).

Town and Country Planning (Tree Preservation) (England) Regulations 2012.

## **Appendices**

- 1. Tree Survey Schedule TWC1357-S-002**
- 2. Survey Criteria and Categorisation**
- 3. Tree Constraints Plan (A3) TWC1357-D-002**
- 4 Glossary of Terms**

## **Appendix 1 Tree Survey Schedule: TWC1357-S-002**

The Observatory, Woolwich Barracks  
Tree Survey Schedule

Tree No.	Species	Height	Crown spread :				Crown clearance	Stem dia. (mm)	Age class	Structural condition	Physiological condition	ERC	Comments	Recommendations	Quality Cat.	RPA-Radius (m)
			N	E	S	W										
T1	Hawthorn	3	2	1	1	3	2	300	M	Poor	Poor	0-10	WLRS-0585. Stem cavity at base to 1.5. Major dieback, minor live growth.	Monitor with view to fell	U	3.6
T2	Holm Oak	5	2	4	4	4	0	20x10	EM	Good	Good	20-40	WLRS-0584. Multi stem at base, probable regeneration from old stump. Low crown.	-	C2	3.4
T3	Copper Beech	12	7	2	7	6	3	860	M	Good	Good	40+	WLRS-0583. Graft at 1.5. Weeping form. Crown lifted, callus wounds and low limb south.	-	A12	10.3
T4	Holm Oak	13	6	7	7	3	3	920	M	Fair	Good	40+	WLRS-0582. Multistem at 2m. Large stem failure wound at 1m with decay but good adaptive growth. Large old pruned stem low east side. Crown lifted wounds.	-	B12	11
T5	Sycamore	12	3	5	5	3	3	350	EM	Fair	Good	10-20	WLRS-0581. Multistem at base, 4 stems, tight unions. Biased SW. Crown lifted.	-	C12	4.2
T6	Sweet Chestnut	12	4	5	3	2	2	590	EM	Good	Good	40+	WLRS-0580. Edge of drive. Slight lean and crown biased East. Minor deadwood.	-	B2	7.1
T7	Holm Oak	16	7	8	8	7	3	780x2	M	Fair	Good	40+	WPRS-0594. Prominent characterful tree within turning circle Island of driveway. Twin stemmed at 0.5m. Large old cavity at base on north side with adaptive growth. Crown lift wounds and cavities. Branch failure tear wound and stub with regeneration.	-	A2	13.2
T8	Holm Oak	12	3	6	7	5	3	860	M	Fair	Fair	20-40	WLRS-0595. Twin at 2.5m. Squat heavily biased crown SE. Crown lifted, several wounds and minor deadwood.	-	B12	10.3

The Observatory, Woolwich Barracks  
Tree Survey Schedule

Tree No.	Species	Height	Crown spread :				Crown clearance	Stem dia. (mm)	Age class	Structural condition	Physiological condition	ERC	Comments	Recommendations	Quality Cat.	RPA-Radius (m)
			N	E	S	W										
T9	Holm Oak	13	3	4	5	6	2	720	M	Fair	Fair	20-40	WLRS-0596. Forks at 1-2m. Old branch failure at base on NE side with exposed heartwood and good adaptive. Crown lifted. Thinning crown.	-	B12	8.6
T10	Broad Leaved Lime	18	6	6	6	5	1	840	M	Good	Good	40+	WLRS-0597. Good form, low crown to west obscured from adjacent tree.	-	A1	10.1
T11	London Plane	25	4	10	8	10	1	1280	M	Good	Good	40+	WLRS-0598. Excellent specimen with shared crown with adjacent Plane. Forks from 4m.	-	A12	15
T12	London Plane	28	10	10	5	12	1	1270	M	Good	Good	40+	WLRS-0599. Excellent specimen with shared crown with adjacent Plane. Forks from 4m. Biased north.	-	A12	15
T13	Sycamore	10	5	3	4	3	3	480	M	Good	Fair	10-20	WLRS-0604. Thinning crown.	-	C12	5.8
T14	Sycamore	15	4	5	6	5	2	530	M	Good	Good	40+	WLRS-0603. Good form.	-	B12	6.4
T15	Sycamore	13	6	6	5	3	4	490	M	Good	Fair	20-40	WLRS-0600. Asymmetric crown.	-	B12	5.9
T16	Holm Oak	12	7	5	1	2	3	500	EM	Fair	Fair	20-40	WLRS-0602. Stem lean and crown biased NE. Minor extends of gardens.	-	B2	6
T17	Sycamore	14	7	6	2	6	5	720	M	Good	Good	40+	WLRS-0601. Crown biased north. Past crown lifted with callus wounds. Overhanging gardens by 3-4m at high level.	-	B12	8.6



The Observatory, Woolwich Barracks  
Tree Survey Schedule

Tree No.	Species	Height	Crown spread :				Crown clearance	Stem dia. (mm)	Age class	Structural condition	Physiological condition	ERC	Comments	Recommendations	Quality Cat.	RPA-Radius (m)
			N	E	S	W										
T18	Sycamore	18	7	7	8	6	3	820	M	Good	Good	40+	No tag. Twin at 3-4m, good crown form.	-	B12	9.8
T19	Sycamore	20	7	4	7	6	3	900	M	Good	Fair	20-40	Oval tag 0451. Near boundary. Thinning crown biased west. Dense basal epicormics and ivy.	-	B12	10.8
T20	Sycamore	16	6	5	6	5	3	450, 400	EM	Good	Fair	20-40	Round tag 1973 on east stem. Top of bank, 2 stems form shared crown. Dense holly at base. Crown lifted.	-	B12	7.2
T21	Holly	8	3	3	3	3	0	300	EM	Fair	Good	20-40	Inspection restricted, dense low canopy. Under sycamore.	-	C12	3.6
T22	Holm Oak	13	4	10	3	2	6	620	M	Fair	Fair	40+	WLRS-0590. Top of bank. Twin at 3m, stem lean and crown heavy biased east, overhanging building. Old wound cavity at 2-3m west side. Minor deadwood.	Reduce back to provide suitable clearance from the building.	B12	7.4
T23	Holm Oak	13	4	8	6	3	4	620	M	Fair	Fair	20-40	WLRS-0592. Old basal wound and cavity. Stem lean and crown biased east. Top of bank. Minor deadwood.	-	B12	7.4
T24	Elm	7	2	8	1	1	1	250	SM	Poor	Poor	0-10	Poor form, heavy asymmetric to the east. 1 dead leader, the other has a thin canopy.	-	U	3
T25	Holm Oak	4	2	4	3	2	0	150x6	SM	Fair	Fair	10-20	WLRS-0593. Multi-stemmed regeneration from old stump.	Coppice and cut back from overhead cables	C1	4.4
T26	Lime - European	18	3	3	4	3	2	650	M	Good	Fair	40+	WLRS-0586. Typical narrow form. Past pollarded at 6-8m with established regeneration. Minor deadwood and dieback. Basal epicormics managed.	-	A2	7.8

The Observatory, Woolwich Barracks  
Tree Survey Schedule

Tree No.	Species	Height	Crown spread :				Crown clearance	Stem dia. (mm)	Age class	Structural condition	Physiological condition	ERC	Comments	Recommendations	Quality Cat.	RPA-Radius (m)
			N	E	S	W										
T27	Lime - European	18	3	3	3	3	5	630	M	Good	Fair	40+	WLRS-0587. Typical narrow form. Past pollarded at 6-8m with established regeneration. Minor deadwood and dieback. Basal epicormics managed. Appears to have reduced upper crown.	-	A2	7.5
T28	Lime - European	16	3	3	3	3	5	660	M	Good	Fair	40+	WLRS-0588. Typical narrow form. Past pollarded at 8m with established regeneration. Moderate small deadwood and dieback. Basal epicormics managed. Appears reduced upper crown.	-	A2	7.9
T29	Lime - European	16	4	4	3	4	4	670	M	Good	Fair	40+	WLRS-0589. Typical narrow form. Past pollarded at 6m with established regeneration. Minor deadwood and dieback. Basal epicormics managed. Appears reduced upper crown.	-	A2	8
T30	Cherry Sp	6	3	3	3	3	2	280	EM	Fair	Fair	10-20	WLRS- tag clear. Crossing branches and crown lifted.	-	C1	3.4
G1	Field Maple (5)	8						150-300	EM	Fair	Fair	10-20	WLRS-0575 TO 0579. Varied form, small collective crowns. Crown lifted.	-	C12	1m beyond canopy spread
G2	Field Maple (4)	6-12						320-570	EM/MM	Fair	Fair	20-40	WLRS-0605 to 0608. Varied form, good spacing, collective form and generally fair.	-	B2	1m beyond canopy spread

## **Appendix 2: Survey Criteria and Categorisation**

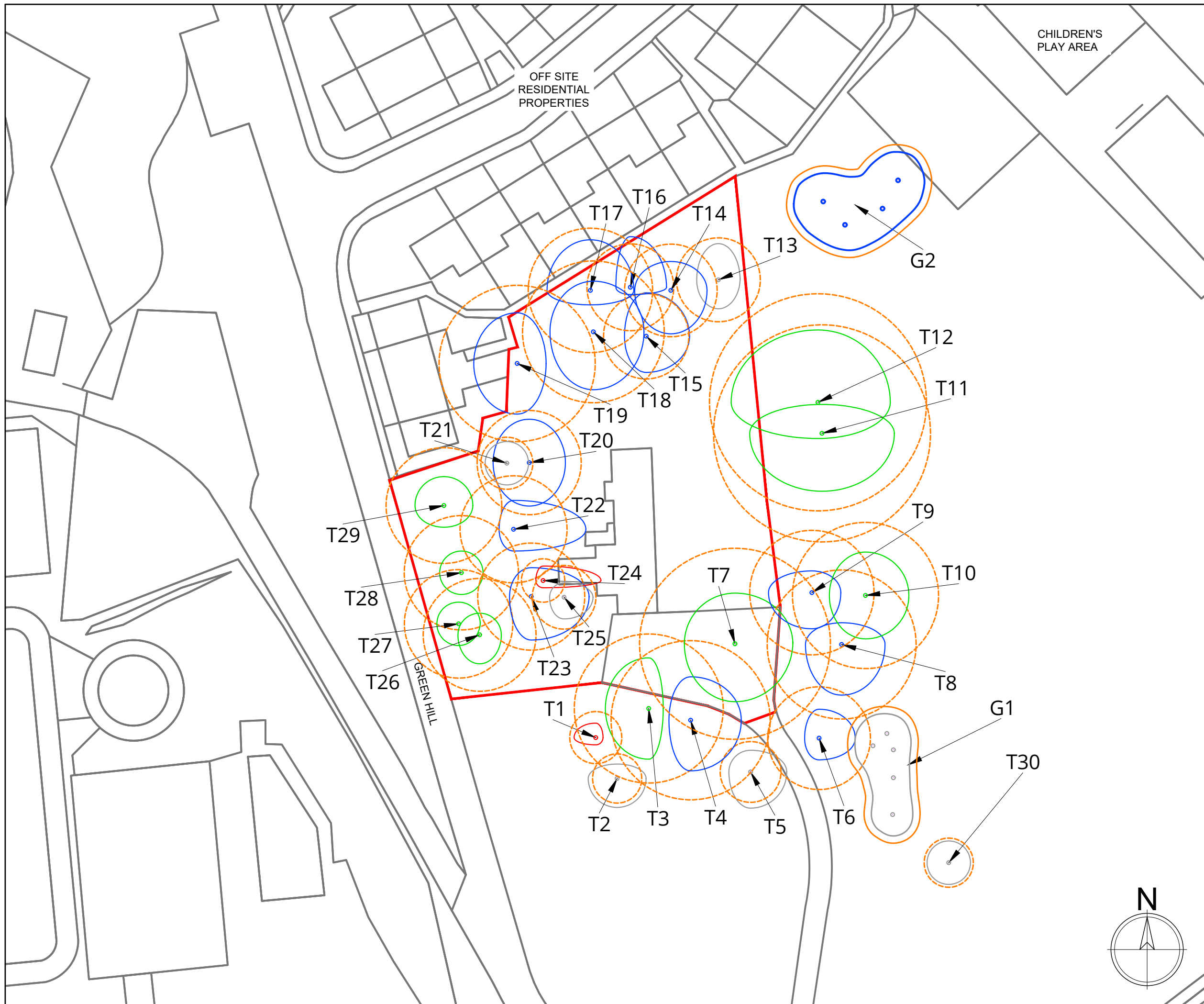
**Table 1: Quality Categorisations**

Quality Category	Trees
<b>Tree No.</b>	Reference ID given to each tree or group of trees (unless tagged).
<b>Species</b>	Common name. Botanical name may be given if clarification is required.
<b>Age Class</b>	Young, early mature, middle aged, mature or over-mature.
<b>Height</b>	Estimated in metres.
<b>Crown Spread</b>	Crown spread (North / East / South / West) measured from centre of trunk, in metres.
<b>Crown Clearance</b>	Approximate height between lowest part of canopy and ground level (metres).
<b>Stem dia</b>	Trunk diameter/s (mm) measured at 1.5m above ground level, or other height as specified.
<b>Structural/Physiological Condition</b>	Good, Fair, Poor or Dead based on the general physiological health and structural condition of the tree.
<b>Estimated Remaining Contribution</b>	An estimation of the life expectancy in years, if the natural cycle of the tree is allowed to run its full course. (<10, 10-20, 20-40, 40+ years).
<b>Comments</b>	A brief description of the tree or group relating to its form, vitality and presence of any significant defects.
<b>Recommendations</b>	All tree work is based on current tree condition and the existing land use and will include work such as hazard abatement, encroachment pruning, thinning of groups/woods and good arboricultural practice.
<b>Quality Category</b>	<p>Categorisation grading in accordance with BS 5837 2012.</p> <p>Trees suitable for retention: - Category <b>A</b> trees of high quality and amenity value. Category <b>B</b> trees of moderate quality and amenity value. Category <b>C</b> trees of low quality or amenity value.</p> <p>Trees unsuitable for retention: - Category <b>U</b> trees.</p> <p>British Standards BS 5837:2012 recommends that these categories may be further broken down into sub-categories A1 A2 A3 pertaining to Arboricultural, Landscape or Cultural values respectively.</p>
<b>RPA</b>	Root Protection Area is based on stem diameter (mm) and is provided as the radius of circle measured in metres from centre of tree, or may be expressed as an area (m <sup>2</sup> )

**Table 1: Quality Categorisations**

Trees unsuitable for retention				
Category and Definition	Criteria (including subcategories where appropriate)			Identification on Plan
<b>Category U</b>  Those in such a condition that they cannot realistically be retained as a living tree in the context of the current land use for longer than 10 years.	<ul style="list-style-type: none"><li>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 U category trees (i.e. Where for whatever reason the loss of companion shelter cannot be mitigated by pruning)</li><li>Trees that are dead or are showing signs of significant immediate or irreversible overall decline.</li><li>Trees infected with pathogens of significance to the health and or safety of other trees nearby by or very low-quality trees suppressing adjacent trees of better quality.</li></ul>			Red
Trees to be considered for retention				
Category and Definition	1. Mainly arboricultural values	2. Mainly landscape values	3. Mainly cultural values	Identification on Plan
<b>Category A</b>  Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are a particularly good example of their species, especially if rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features.	Tree groups or woodlands of particular visual importance as arboricultural and/or landscape features.	Tree groups or woodlands of significant conservation historical, commemorative or other value	Green
<b>Category B</b>  Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.	Trees that might be included in the high category but are downgraded because of impaired condition.	Trees present in numbers, usually 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 benefits.	Blue
<b>Category C</b>  Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.	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 landscape value and/or trees offering low or only temporary/transient landscape benefits.	Trees with no material conservation or other cultural benefits.	Grey

## **Appendix 3: Tree Constraints Plan (A3) TWC1357-D-002**



**KEY**  
**Tree Categorisation:**  
(Tree quality assessment based on BS 5837:2012 Trees in relation to design, demolition and Construction - Recommendations)  

**Crown spread of category A**  
Trees/groups/hedges of high quality and value

**Crown spread of category B**  
Trees/groups/hedges of moderate quality and value

**Crown spread of category C**  
Trees/groups/hedges of low quality and value

**Crown spread of category U**  
Trees/groups/hedges unsuitable for retention

**Root Protection Area (RPA)**  
To be used to inform design proposals and assess potential tree impacts. It represents the minimum area around each tree that should be left undisturbed to ensure their survival.

**Survey boundary**

**NOTES**  
Approximate tree positions

- All trees plotted approximately using Ordnance Survey base plan, a GPS device and on site measurements.
- A Topographical Survey Plan will be required to accurately plot tree positions for a detailed design stage and the Tree Constraints Plan must be updated.
- To be read in conjunction with Tree Survey Schedule 1357-S-002

**PROJECT INFO**  
**Project:** The Observatory  
Woolwich Royal Artillery Barracks  
**Title:** Tree Constraints Plan **DRAFT**  
**Client:** Sweco Uk Ltd, on behalf of Defence Infrastructure Organistaion (DIO)

**Project No:** 1357  
**Drawing No:** 1357-D-002

**Rev:**  
**Scale:** 1:500 @ A3  
**Date:** 10.10.2022  
**Drawn:** RO'S  
**Checked:** ABS  
**Figure No:**

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## **Appendix 4: Glossary of Terms**



## Glossary of Terms

Term	Definition
Adaptive Growth	The process of wood formation by which a tree maintains uniform distribution of mechanical stress.
Apical Growth	Growth promoted by an apical meristem enabling the lengthening of roots and shoots.
Arboricultural Impact Assessment	Evaluation of direct and indirect effects of a proposed design and/or construction on an existing tree population.
Arboricultural Method Statement	Methodology for the implementation of any aspect of development that is within the root protection area or has the potential to result in loss of or damage to a tree to be retained.
Arboriculturist	A person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction.
Canopy Spread	A measurement taken from the centre of a tree to the furthest radial extension of tree canopy relative to the cardinal points of the compass.
Co-dominant	The growth of two or more arising branches emerging from the same junction of near equal diameter.
Conservation Area	Local Planning Authority special designation generally prohibiting tree works without 6 weeks prior written notification.
Construction Exclusion Zone (CEZ)	Area based on the root protection area of a tree from which access is prohibited for the duration of a project.
Crown Lift	The selective removal of limbs and small branches to achieve a stated vertical height above ground level.
Crown Reduction	A specified reduction in crown size whilst preserving, as far as possible, the natural shape of the tree.
Crown Thin	The removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure.
DBH	(Diameter at Breast Height). Stem diameter measured at a height of 1.5m or the nearest measurable point.
Deadwood	Dead branch wood.
Dieback	The death of parts of a woody plant, starting at the shoot tips or root tips.
Epicormic Growth	The stimulation and growth of dormant young buds within the trees bark, often onset following pruning or physiological stress.
Fibrous Root	A root system made up of numerous branching roots of more or less equal length.
Included Bark	Bark of adjacent parts of the tree (usually forks, acutely joined branches or basal flutes) which is in face to face contact.
Lateral Limb/Branch	Second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches.
Local Planning Authority	The local government body that is empowered by law to exercise urban planning functions for a particular area.
Occlusion	Wood development enclosing a wound or pruning cut.
Physiological Condition	Observation relating to a trees physiology for example vigour, leaf area, growth rate, the presence of pests or disease.

Term	Definition
Pollarding	The removal of the tree canopy back to the stem or primary branches, usually to a point just outside of that of the previous cutting.
Primary Limb/Branch	First order branch arising from a stem.
Pruning	The targeted removal of branches or limbs, most often using saws or other cutting tools.
Root Protection Area (RPA)	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.
Stress	A condition under which one or more physiological function are not operating within their optimum range, for example, due to a lack of water, inadequate nutrition or extremes in temperature.
Structural Condition	Observation relating to a trees structural integrity and the presence of any physical defects.
Structural Root	Roots generally having a diameter greater than 10mm and contributing significantly to the structural support and stability of the tree.
Sub-Lateral Limb/Branch	Third order branch, subordinate to a lateral, or primary branch, or stem and usually bearing only twigs.
Tree Constraints Plan	A scaled plan indicating above and below ground constraints relating to the protection of trees.
Tree Preservation Order	An order made by a local planning authority in England to protect specific trees, groups of trees or woodlands in the interests of amenity.
Tree Protection Plan	A scaled plan, informed by descriptive text where necessary, based upon the finalized proposals, showing trees for retention and illustrating the tree and landscape protection measures.
Understorey	Woodland layer consisting of younger individuals of the dominant trees, together with smaller trees and shrubs which are adapted to grow under lower light conditions.
Union	The point of attachment between two stems, a stem and a limb, or two limbs.
Veteran Tree	A tree that, by virtue of its great age, size or condition, is of exceptional cultural, landscape or nature conservation value.
Vigour	A measure of the trees capacity for growth.
Visual Tree Assessment	A method of assessment based upon the research developed to recognise dynamic responses of a tree to its surroundings.
Vitality	A measure of the physiological condition of the tree.
Wind-Throw	The blowing over of a tree at its roots.



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