FORTESS WORKS
FORTESS GROVE
CAMDEN
LONDON

ARBORICULTURAL REPORT
TREE SURVEY
IMPACT ASSESSMENT
&
METHOD STATEMENT

ACD ENVIRONMENTAL

Ecology
Archaeology
Arboriculture
Landscape Architecture

CBRE Global Investors

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1. Executive summary

1.1. The proposed layout is in line with recommendations of BS5837:2012 Trees in relation to design, demolition and construction. Adequate protection can be provided to ensure all retained trees are protected throughout development.

1.2. The existing site is the subject of a consented scheme of B1 office accommodation across two former industrial warehouses of Fortess Works. The consent relating to extensions and alterations to 'Studio B' comprises increasing height of existing parapet, erection of a single storey roof extension, rear infill extension, external alterations and landscaping of courtyard; provision of UKPN substation and external alterations to Railey Mews (ref: 2017/6788/P). No trees are to be removed to implement the consented scheme. Some facilitation pruning works will be required to improve the construction access to the building sides and roof area. Condition 7 of planning permission ref: 2017/6788/P requires that;

Prior to the commencement of any works on site, details demonstrating how trees to be retained shall be protected during construction work shall be submitted to and approved by the local planning authority in writing. Such details shall follow guidelines and standards set out in BS5837:2012 "Trees in Relation to Construction". All trees or parts of trees growing from adjoining sites, unless shown on the permitted drawings as being removed, shall be retained and protected from damage in accordance with the approved protection details.

1.3. The historic industrial use and age of the existing warehouse built form together with internal trial pits has demonstrated that there are no instances where offsite trees have rooting encroaching beneath the external boundary walls. Therefore, tree protection measures are limited to ground protection to be installed within any scaffold installation.

1.4. The relationship between the warehouse buildings and retained trees is sustainable and does not result in any situations that may result in unreasonable pressure to prune requests from future occupants.

1.5. The arboricultural method statement and tree protection plan include details of all tree protection measures required, including provision for site supervision where required.

2. Introduction

2.1. CBRE Global Investors instructed ACD Environmental in February 2020 to prepare the following arboricultural report which contains impact assessment and method statement elements.

2.2. Following the recommendations of the British Standard[1], this report includes the necessary information to support a planning application. It demonstrates that the impact, both direct and indirect, of the proposed development within the site, has been assessed and where appropriate, mitigation and tree protection proposed.

2.3. The implementation of any protection methods and special construction details recommended within this report are critical for ensuring the retained trees are successfully protected through the construction process and must be implemented prior to any work on site.

2.4. This assessment is based upon the supplied layout drawing and tree reference plan, drawing number PRI22797-01.

2.5. The controlling authority is Camden Council, who can be contacted at:

Planning, Camden Council, Camden Town Hall, London, WC1H 8ND.
(020) 79744444

2.6. This assessment considers the impact of the development on the constraints posed by the retained trees (both beneath ground: the root protection area (RPA), and above ground: the canopy).

2.7. Direct impact from development comes in six main forms: 1) Surface installation within RPAs, 2) Root loss from excavation for foundations, drainage and other utilities within RPAs, 3)Soil stripping, removal and level changes within RPAs, 4) Excessive access facilitation pruning to retained trees, 5) Soil compaction from storage and vehicle movements within RPAs, 6) Soil contamination.

[1] *BS5837:2012 Trees in relation to design, demolition and construction- Recommendations,* London: British Standards Institute

2.8. Indirect impact can come from changes to the site hydrology, future pressure to prune or fell, failure of trees exposed by removal of neighbouring trees, and other environmental changes which can take several years to manifest.

2.9. The RPA for each tree represents a minimum area in m² that should be left undisturbed around each retained tree. This is initially represented by a circle but is often adjusted to account for constraints to root growth within the site (primarily highways and buildings). It is therefore important to ensure the protection of trees both above and below ground. Recommendations are provided in the British Standard as to the protection of existing trees before, during and after development. This is achieved by ensuring the tree protection plan and arboricultural method statement are implemented before any commencement on site.

Figure 1 Overview of survey area

3. Scope and method of survey

3.1. The survey schedule can be found at Appendix 2.

3.2. The survey has been carried out following the recommendations of The British Standard and the trees are assessed objectively and without reference to any site layout proposals. Categories are based on each tree's health and condition, together with an assessment of its life expectancy if its surroundings were to be unchanged.

3.3. The reference numbers of surveyed trees and groups of trees are shown on the tree reference plan, which is appended to this report and based on the supplied survey drawing. The prefix G has been used to indicate a group of trees, and H for hedges. Stem locations within groups may be estimated, and indicative of canopy only.

3.4. The tree survey was carried out from ground level only, with the aid of binoculars as necessary, following the VTA tree assessment method[2]. The tree behind Fortess Works within the rear gardens of properties on Fortess Road were inaccessible so positions are based onsite visual notes and Google Maps 3D data.

Figure 2 Showing 3d imagery of off-site trees

[2] Mattheck, C. & Breloer, H., 1998. *The Body Language of Trees: A Handbook for Failure Analysis.* London:H.M.S.O.

3.5. Where stems or branches are obscured by ivy or other materials a full assessment of those parts will not be possible.

3.6. Tree heights were measured with a clinometer or estimated in relation to those measured with the clinometer. If individual tree heights are of particular concern, for example in shading calculations, then they are measured using a clinometer.

3.7. Trunk diameters were measured or, where inaccessible, estimated. Single stemmed trees are measured at 1.5m above ground level.

3.8. Tree canopies, where markedly asymmetrical, were measured (or estimated by pacing) in four directions using a laser measure. Symmetrical canopies are measured in one direction only, with dimensions in the remaining directions assumed to be similar. For the canopies of groups of trees, the maximum radius for each compass point is measured (more complicated groups will have further notes taken and an accurate representation will be shown on the plan).

4. Trees stock and site overview

4.1. For individual details of the subject trees see the survey at appendix 2.

4.2. The site comprises the industrial buildings of the former Fortess Works. The site is located just 350m north of Kentish Town station on Fortess Grove, a small street running east from Fortess Road. Tree stock is found adjacent to the site boundaries in private garden space.

4.3. A total of four individual trees with stem diameters of 75mm and above at 1.5m were surveyed and recorded. In addition, three off-site trees are identified on the tree reference plan, these trees were inaccessible at the time of the survey, so they are included without survey data. An estimate of their positions is made by onsite visual assessment and Google Maps 3D data.

4.4. The below ground constraints posed by the trees are represented by Root Protection Areas (RPAs) and shown on the Tree Reference Plan. The RPA of a tree is calculated as advised by BS5837:2012. For a tree growing in an apparently unconstrained rooting environment a circular RPA is shown. When constraints to root growth appear to be present the RPA is adjusted to reflect the likely root growth pattern.

4.5. In the case of all the trees found off-site around the periphery of the former coach works, internal trial pits have demonstrated that there is no root growth under the outer walls. Therefore, all the RPAs of the trees have been adjusted in shape, but not reduced in total area to reflect this. Photo evidence is presented within section 5.6.

4.6. The RPAs of trees nos. T1 – T4 have not been adjusted to the carriageway of Fortess grove as it is not a substantial road so there is likely adequate rooting environment beneath.

5. Arboricultural Impact Assessment

5.1. Overview of proposed development

5.1.1. The existing site is the subject of a consented scheme of 27158 sq.ft. of B1 office accommodation across the two former industrial warehouses of Fortess Works. The construction footprint of the existing warehouses will remain the same with internal changes only and infilling of the rear yard area. To include new roof and fenestrations. All trees are found offsite and only minor pruning works to facilitate the consented application are required.

5.2. Planning context

5.2.1. **Tree Preservation Orders/Conservation Area:** The recorded trees are not subject to a Tree Preservation Orders (TPOs), however the site falls within The Kentish Town Conservation Area.

5.2.2. **Previous planning applications and consents:** The site is the subject of a consented planning application of B1 office accommodation across the two former industrial warehouses.

5.3. Trees proposed for removal & surgery

5.3.1. All the trees listed are sited outside the footprint of the existing buildings. The design proposals encompass the renovation of the existing buildings with internal changes only.

5.3.2. No trees will need to be removed to facilitate the design proposals. However, as the roof is being replaced where off-site trees are trespassing into the site and abutting the existing roof, some degree of tree pruning will be expected.

5.3.3. This should be limited to facilitation pruning to implement the consented planning application.

5.3.4. Tree surgery works that are not required to facilitate the consented planning application will need to be submitted to and approved by Camden Borough Council before being implemented.

5.4. Services

5.4.1. Full details of the service and utility provisions for the site remain to be finalised. However, there is adequate space for utility trenches to access the site whilst avoiding RPAs and exclusion zones.

5.5. Protection fencing

5.5.1. The lack of onsite trees and position of offsite trees makes implementation of tree protection fencing impossible. The existing building walls will have to provide the protection to these trees. If a temporary fence line is required moving forward the following should be utilised.

5.5.2. Figure 2 of the British Standard recommends a standard fencing design for tree protection. This is a weld mesh panel design, mounted upon a well-braced scaffold framework. This is perfectly adequate for this site and all the retained trees can be suitably protected by its erection before any works start on site whatsoever.

5.6. Construction footprint within RPAs

5.6.1. The construction footprint of proposed buildings/units are sited outside the RPAs of trees identified for retention.

5.6.2. The RPAs of the offsite adjacent trees are shown with adjusted RPAs to indicate the likely morphology and disposition of the roots being influenced by the existing substantial footings/foundations of the existing industrial warehouses.

Figures 3 & 4 (L) internal trial pit adjacent to southern outer wall, on opposing side are (R) offsite trees on Fortess Grove

5.6.3. Whilst the trees within the garden areas of the properties on Fortess Road are inaccessible an additional trial pit has been excavated to review if any root encroachment has occurred in the northern warehouse.

Figures 5 & 6 (L) internal trial pit adjacent to western outer wall (northern warehouse), on opposing side are (R) offsite trees within rear gardens on Fortess Road.

5.6.4. As visible from the photos, the site being of industrial use is of an age where there has been no encroachment by rooting of any offsite trees.

5.7. Access and working room within RPAs

5.7.1. The scope of required scaffold installation required for this project is unknown at time of report writing. Any scaffold installation on the outer walls will be within third party land and will be subject to agreement between interested parties. Following the recommendations of 6.2.3 of the British Standard, ground protection will be employed to retain the underlying soil structure and avoid detriment to roots. This should be installed within the required scaffold framework.

6. Arboricultural Method Statement

TO BE READ INCONJUNCTION WITH THE APPENDED TREE PROTECTION PLAN REF: PRI22797-03

6.1. Phasing of operations & site supervision

6.1.1. The tree protection and other arboricultural related works must be carried out in the following order:

Phase		Operation	Present	Notes
Preliminary	1	Tree surgery (as required for scaffold installation)	Tree contractor	See Tree Protection Plan for trees to be removed
	2	Pre-start meeting	LPA representative, site manager, groundwork, foreman	To 'sign-off' any protection prior to any plant activity, demolition & groundworks on site
Construction phase	3	Installation of scaffold framework		Facilitation pruning to be limited to space for scaffold installation.
	4	Removal of protection measures	Site manager	Installed within scaffold installation so removed at same time

6.1.2. As advised within the arboricultural impact assessment element of this report. The lack of rooting environment and the nature of the proposed works, being wholly contained within the construction footprint of the existing, tree protection measures are limited across the site.

6.1.3. Supervision would be required should any unplanned access and/or work be required in the construction exclusion zone.

6.1.4. Supervision will require the arboriculturist to be present throughout the task, to ensure all the arboricultural objectives are met. If the task is to take a long period of time, provided the arboriculturist is satisfied, and after an initial 'tool-box talk', the supervision may be reduced to telephone contact between the site foreman/contractor and arboriculturist.

6.2. Site storage, parking, welfare facilities, etc.

6.2.1. The site will require provision for; site storage, contractor parking, welfare facilities, temporary services/drainage, material drop off points, etc.

6.2.2. None of the above provisions will be sited within RPAs of retained trees without the input of the project arboriculturist and the consent of the local planning authority.

6.3. Tree surgery and removal

6.3.1. Tree surgery works are limited to facilitation pruning for installation of scaffold. Should additional surgery works be required they should be submitted to and approved by Camden Council before being implemented.

6.3.2. All work will be carried out in accordance with BS3998[3] industry best practice and in line with any works already agreed with the council.

6.3.3. The tree surgeon shall ideally be chosen from The Arboricultural Association's Approved Contractor list. All work shall be undertaken at the appropriate time and with the consent and approval of the Site Agent.

6.3.4. The statutory protection[4] [5] will be adhered to. If further advice is required, particularly if bats are discovered during tree work, it will be obtained from Natural England or other competent persons and recommendations adhered to.

6.3.5. The stumps of any trees removed from within the Construction Exclusion Zone or the RPAs of retained trees will be either; cut flush to ground level and left in situ or ground out using a stump grinder. They will not be winched out.

6.3.6. All operations shall be carefully carried out to avoid damage to the trees being treated or neighbouring trees. No trees to be retained shall be used for anchorage or winching purposes.

[3] *BS3998:2010- Recommendations for Tree Work.* London: British Standards Institute
[4] *WIldlife and Countryside Act.* (1981) London: HMSO.
[5] *Countryside and Rights of Way Act.* (2000) London: HMSO.

6.4. Tree protection areas

6.4.1. Based on tree survey data, tree protection areas have been determined for every retained tree. These areas are designed to protect at least a functional minimum of tree root mass in order to ensure that the trees survive the construction process.

6.4.2. It is the responsibility of everyone engaged in the construction process to respect the tree protection measures and observe the necessary precautions within and adjacent to them.

6.4.3. Inside the exclusion area of the fencing, the following shall apply:

- No mechanical excavation whatsoever
- No excavation by any other means without arboricultural site supervision
- No hand digging without a written method statement having first been approved by the project arboriculturist.
- No lowering of levels for any purpose (except removal of grass sward using hand tools)
- No storage of plant or materials
- No storage or handling of any chemical including cement washings
- No vehicular access
- No fire lighting

6.4.4. In addition to the above, further precautions are necessary adjacent to trees:

- No substances injurious to tree health, including fuels, oil, bitumen, cement (including cement washings), builders sand, concrete mixing and other chemicals shall be stored or used within or directly adjacent to the protection area of retained trees
- No fire shall be lit such that flames come within 5m of tree foliage.

6.5. Installation of underground services

6.5.1. Whilst it is proposed to utilise existing service infrastructure together with the ample space at the site entrance, should it become necessary to excavate within RPAs of retained trees the following methodology should be followed.

6.5.2. Mechanical trenching for the installation of underground apparatus and drainage severs any roots present and can change the local soil hydrology in a way that adversely affects the health of the tree. For this reason, particular care should be taken in the routeing and methods of installation of all underground apparatus. Wherever possible, apparatus should be routed outside RPAs. Where this is not possible, it is preferable to keep apparatus together in common ducts. Inspection chambers should be sited outside the RPA.

6.5.3. Stages for installing services by hand within tree protection areas:

No plant machinery to be used in the area for whatever reason

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work
2) Remove any surface vegetation or existing hard surfaces using hand tools
3) Using and air-pick excavate the trench, keeping to minimum dimensions required
4) Roots occurring in clumps of 25 mm diameter and over are encountered they will be retained, and kept damp by covering with hessian (re-wetted as required). If required, these should be severed only following consultation with an arboriculturist, as such roots might be essential to the tree's health and stability
5) Feed in services.
6) Back fill trench with 200-300mm depth of excavated soil, or a mixture of excavated and imported top-soil to BS3882 (BSI, 2007), firming down with heels
7) Repeat step 7 until trench is filled
8) Re-erect tree protection fencing as per approved plan

6.5.4. The method of excavation above, for trenching within RPA's, is using air excavation. This tool utilises compressed air to remove soil from around tree roots causing minimal damage and can be run of a typical site compressor. ACD can provide details of contractors supplying air excavation services if required.

6.5.5. Alternatively, trenchless technology, such as thrust boring can be used in some instances and is particularly effective as it can pass directly under the tree, at a depth which is likely to avoid almost all impact on roots of the subject tree. As no access/thrust pits will be located within the RPAs of the subject trees, the need for arboricultural supervision is limited.

Andrew Bigg RFS CertArb
Arboriculturist
4th March 2020

Appendix 1: Tree Categories Explained

BS5837:2012 Table 1 -**Cascade chart for tree quality assessment**			
Category and definition	**Criteria (including subcategories where appropriate)**		
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.***		
	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)
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
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 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 collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value

Appendix 2: Tree Survey Schedule

Tree Survey Schedule

No.	Name	Ht (crown)	Dia (stems)	Canopy spread N | E | S | W				Life stage	ERC	Comments & preliminary recommendations	BS Cat
T1	Ailanthus altissima (Tree of Heaven)	15(12)	250(1)	3	3	3	3	SM	20+	Tree of moderate quality and value. Growing off-site within 'courtyard' garden environment. Tree abuts wall of adjacent warehouse. RPA adjusted to wall given extent of footings and soil makeup (heavy clay).	B2
T2	Betula pendula (Silver Birch)	14(9)	300(1)	3	3	3.5	3.5	SM	40+	Tree of moderate quality and value. Growing off-site within 'courtyard' garden environment. Tree abuts wall of adjacent warehouse. RPA adjusted to wall given extent of footings and soil makeup (heavy clay).	B2
T3	Acer platanoides (Norway Maple)	14(7)	250(2)	3	3	4	4	SM	20+	Tree of moderate quality and value. Growing off-site within 'courtyard' garden environment. Tree abuts wall of adjacent warehouse. RPA adjusted to wall given extent of footings and soil makeup (heavy clay).	B2
T4	Malus sylvestris (Crab Apple)	9(3)	200(1)	3	1.5	2	3.5	SM	10+	Small individual of reduced quality and value. Crown architecture touching external warehouse walls. Growing off-site within 'courtyard' garden environment. Tree abuts wall of adjacent warehouse. RPA adjusted to wall given extent of footings and soil makeup (heavy clay).	C2

Notes: Dia (stems): trunk diameter in mm at 1.5m above ground level (number of stems) | **HT (crown):** Tree height (crown clearance) | **Life stage: Y**: Young (obviously planted within the last three years (unless as a heavy or extra-heavy standard)). **SM**: Semi mature (recently planted and yet to attain mature stature; up to 25% of attainable age.). **EM**: Early mature (almost full height, crown still developing and seed bearing; up to 50% of attainable age.). **M**: Mature (full height, crown spread, seed bearing; over 50% of attainable age.). **OM**: Over mature (full size, die-back, small leaf size, poor growth extension.).| **FSB:** First significant branch (& compass bearing) | **ERC:** Expected remaining contribution in years- <10, 10+, 20+, 40+ (assuming that there will be no physical changes to its immediate environment.| **BS Category:** Refer to appendix 1 of this report **or** BS5837:2012 Table 1 for detailed descriptions.

Appendix 3: Tree Reference Plan

PRI22797-01

Appendix 4: Tree Protection Plan

PRI22797-03

Head Office
Rodbourne Rail Business Centre
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Website: www.acdenvironmental.co.uk

ECOLOGICAL SURVEYS * PROTECTED SPECIES LICENSING * MITIGATION * IMPACT ASSESSMENT
ARBORICULTURAL SITE MONITORING AND SUPERVISION * ARCHAEOLOGY
LANDSCAPE & VISUAL IMPACT ASSESSMENT * LANDSCAPE AUDIT * PROJECT MANAGEMENT
EXPERT WITNESS* LANDSCAPE DESIGN & PLANNING LANDSCAPE MANAGEMENT