

ARBORICULTURAL IMPACT ASSESSMENT FOR DEVELOPMENT.



**31 Ferncroft Avenue,
London,
NW3 7PG**

In accordance with BS5837:2012

Prepared by; Michael barker on behalf of:

Ace of Spades Gardens Ltd.

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Ace of Spades Gardens Ltd.

www.aceofspadesgardens.co.uk

info@aceofspadesgardens.co.uk

tel. 01603 487447

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EXECUTIVE SUMMARY

This report follows an invitation to survey a single roadside tree located within the pavement to the front of 31 Ferncroft, Avenue, London NW3 7PG, in accordance with BS5837:2012, which is implicated within a proposed planned development.

The building proposal is to level and infill the existing ramp/driveway, which leads from the highway to the lower ground floor garage, thereby creating a level parking area for two cars. The current garage will be converted into a utility area which will then allow the existing family room to be extended under the driveway.

The tree surveyed is not located within the curtilage of the property but is a third party tree and is the responsibility of the local authority highways department.

INTRODUCTION

Recommendations for tree works are made within this report. All trees surveyed are to be referred to in the site plan and/or **Tree constraints plan Appendix 3** to locate the trees.

Tree works are based upon the following parameters:

- Advisory tree works based on sound arboricultural guidance.
- Trees to be removed for arboricultural reasons within the proposed area.
- Tree works to allow access within the proposed area.
- Tree works to allow development to take place within the proposed area.

SUMMARY OF TREE WORKS

The following table summarizes the proposed/advised tree works:

TREE NUMBER	SPECIES/ CATEGORY	TREE WORKS RECOMMENDATIONS	REASON
T001	London Plane – A	<ul style="list-style-type: none"> • No Action Required 	Highways owned tree

1.0 Terms of reference:

The aim of this report is to assess the condition of any tree which may be affected by the development at the above site.

In addition to surveying and categorizing the trees. The report seeks to assess their importance in the landscape and likely future growth and provide defensible industry standard recommendations for protecting the trees during construction based on BS5837:2012 "Trees in relation to design, demolition and construction - Recommendations".

Hand drawn plans and concept drawings of the proposed area of development were provided.

2.0 Site Description:

The development site is located to the north-west of the London Borough of Camden and lies within the Camden Council area of jurisdiction.

The proposed development site sits within the curtilage of land at 31 Ferncroft Avenue, London. There is currently a four storey residential town property on the site which will be altered in order to create greater space within the lower ground floor area.

To the north, east and west of the property are other residential dwellings, whilst to the south are the grounds of the West Heath Lawn Tennis Club.

The ground conditions to the front of the property were level, not including the ramp/driveway, and consisted mainly of concrete and tarmac except for the 2m square area of soil in which the tree is situated. The boundary to the front was mainly open except for a short section of low brick wall.

Trees:

T001 is a mature London Plane situated within the roadside pavement area. At the time of the survey it had been re-pollarded leaving only a skeleton of the crown scaffold.

The trees roots are impacting upon the surrounding structures, the dwarf wall of the property which is approximately 600mm from the tree is showing evidence of cracking at its corner (see **Appendix 6 – Photo 5**), one of the gate pillars is leaning towards the road (see **Appendix 6 – Photo 3**) and the neighbouring gate post and wall corner are also leaning (see **Appendix 6 – Photo 2**).

The tree is located within a conservation area in relation to T001 however it is a local authority owned tree.

Soils:

Bedrock Geology: Claygate Member – Clay, Silt & Sand.

Superficial Deposits: None recorded.

3.0 Tree Survey Details:

The tree was surveyed on the 18th December 2019, it was not climbed but surveyed from ground level.

Appendix 1 relates to the Tree Survey schedule. It gives the survey findings in a tabular form which conforms to the example in **Annex D** of the BS5837 standard document.

Appendix 2 gives a full explanation of the survey headings as per **Annex C** of the BS5837 standard document.

The tree was surveyed based upon implications for limited health and safety of the site users and was independent of any development proposals. The categorisation of the quality and amenity value of the tree is made on purely arboricultural values.

4.0 Constraints posed by vegetation to the initial proposed development area:

The constraints posed by the tree vegetation can be broadly categorised as **below ground** and **above ground** constraints. (See **Tree Constraints Plan (TCP) Appendix 3**).

One constraint from trees is the shading they produce. This is partly displayed upon **TCP Appendix 3**.

It is my understanding that the proposed development is to be located within the land area. The tree is located to the north-east of the proposed development area.

North-east of the proposed development site: T001 London Plane.

T001 is a Category A tree.

Above ground constraints:

There will be leaf and seed fall from this tree at certain times of the year.

This tree does not currently cast any shade across the proposed development area and will not do so as it continues to develop and achieve its potential ultimate height, which will also be restricted due to the cyclical pollarding regime which appears to be in place.

Below ground constraints:

The RPA (Root Protection Area) of this tree will be a constraint with regards to the construction process depending upon the exact location of root development, bearing in mind the quantity of concrete and tarmac covering the area and creating challenging growing conditions.

TREE NUMBER	Arboricultural Impacts to Trees
<p><u>North-east of the proposed development site: T001 London Plane.</u></p>	<p>This is a Category A tree.</p> <p><i>Below ground impact:</i> The proposed development encroaches significantly into the south-west quadrant of the RPA of this tree. Due to the concrete surfacing of the driveway and the steep fall it is uncertain the extent of major roots will be present within this area The route of the access drive and basement extension encroaches upon the RPA's of all this tree.</p> <p>Tree roots require moisture, oxygen, and uncompacted soil.</p> <p>A no dig cellular construction method shall be used to construct the drive. However, due to the possible presence of major roots within the area of development it will be necessary to break and remove the concrete by hand. Open up trial pits and then begin excavations using an air spade/soil vacuum until we can confidently ascertain the presence/extent of rooting in the area.</p> <p>The building encroaches into the RPA's of T001, traditional methods of foundation construction would mean the severance of tree roots causing stability and physiological decline. Engineered foundations shall be used if tree roots are found.</p> <p>In order to improve the rooting conditions for the tree it would be advisable to construct the new driveway using a cellular system (such as ArborRaft Tree Planting System) incorporating a suitable rooting medium and to install a root barrier to restrict the eventual root spread towards the new extension as well as preventing chemical damage to the root system from contact with concrete.</p> <p>In order to prevent damage to roots within the remainder of the RPA, located within the front garden, ground protection will need to be installed which shall remain in situ for the duration of the construction process.</p> <p>In order to safeguard the tree during the construction process, from the movement of vehicles and building plant, the tree will be individually protected as detailed within <i>Appendix 5.</i></p> <p><i>Above ground impact:</i> Due to the cyclical pollarding programme in place it is unlikely that this tree will come into conflict with the property in the future.</p>
	<p>ISSUES TO BE ADDRESSED BY THE ARBORICULTURAL METHOD STATEMENT (A.M.S.) <i>Appendix 6</i></p>

5.0 Recommendations for pre-application team to enable development site design.

Conditions:

The following factors shall be discussed and agreed during design team meetings.

- Demolition of existing driveway.
- Design and installation of the sub surface cellular planting system and root barrier.

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- No dig driveway.
- Basement foundation design and drainage system from atop the basement
- Soil profile to be determined and porosity.
- Root excavation determine extent of root volume versus basement extension
- Location of materials storage.
- Contractors vehicle parking.
- Tree protection measures.



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Appendix 1 Tree Survey Data

DEVELOPMENT SITE TREE SURVEY

CLIENT: VAN OS ARCHITECTURE, 19A RASTELL AVENUE, STEATHAM HILL, LONDON SW2 4XP
SITE: 31 FERNCROFT AVENUE, LONDON NW3 7PG
SURVEYOR: JON GIBBS
DATE OF SURVEY: 18TH DECEMBER 2019

BS5837 Report

31 Ferncroft Avenue, London NW3 7PG



TREE CARE | LANDSCAPE | CONSULTANCY

Ref	Species	Full Structure	Measurements	Spread	General Observations	Retention Category	RPA	Measurements2	Recommendations
T001	Plane, London (<i>Platanus x hispanica</i>)	Tree	Height (m): 12 Stem Diam (mm): 700 Spread (m): 2.5N, 2.5E, 2.5S, 2.5W Crown Clearance (m): 7 Lowest Branch (m): 4(W) Life Stage: Early Mature	N:2.5 E:2.5 S:2.5 W:2.5	Base: Located within 2m square paved/road area. Direct damage to adjacent wall. Crown: Recently re-Pollarded. Cavity in crown scaffold branch to N.	A1,2	Radius: 8.4m. Area: 222 sq m.	Physiological Cond: Good Structural Cond: Good Bat Habitat: Low	No Action Required



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Key: Appendix 1 – Tree Survey Data

Dead wood:

Minor = <50mm

Moderate = 50-100mm

Major = >150mm

Tree condition:

P = Physiological Condition

W = Initial Managed Works recommendations

Denotes some or all measurements are estimated as access to tree base prevented/clear line of site obscured.

AGL/agl: Above ground level GL/gl: Ground level

Appendix 2 – Notes on Column Headings in Appendix 1

COLUMN NO.	TITLE	NOTE
1	Tree No.	Tree numbers to correspond with those on the Tree Constraints Plan. (TCP).
2	Species	Each tree is identified with its scientific and common name.
3	Ht (m)	The tree height in meters to the highest point or tip measured from ground level.
4	Stem dia (mm)	Stem diameter is in millimetres measured at 1.5 meters above the ground.
5	Branch spread (m).	The branch spread measured in meters from the stem to the tip of the outer branches have been measured in four directions of the compass, North, South, East and West. Unless the trees form part of boundary trees. # indicates an estimate when access is not possible.
6	First branch direction.	First significant branch height and direction in meters.
	Height of clearance	Height of clearance in meters from the ground to the lowest branches. (Meters)
7	Life Stage	Assessment of age class of the trees into one of the following categories: Young Y; Semi-Mature SM; Early Mature EM; Mature M; Over Mature OM
9	Estimated remaining contribution	Estimated remaining contribution of the tree in years: <10 years.10+ years, 20+ years and 40+ years.
10	Category grading	<p>U =Those in such a condition (including irremediable structural defects) that any existing value would be lost within 10 years, and would be removed for reasons of sound arboricultural management.</p> <p>A = Trees of a high amenity quality and value and in such a condition to make a substantial contribution. (>40 years).</p> <ol style="list-style-type: none"> 1. <i>Trees that are good examples of their species; rare, unusual or essential components of groups or formal or semi-formal tree features</i> 2. <i>Trees, groups or woodlands which provide definitive screening or softening effect to the locality in relation to views in or out of the site, or those of particular importance.</i> 3. <i>Trees, groups or woodlands of significant conservation, historical, commemorative or other value. (Veteran or wood pasture).</i> <p>B=Those of moderate quality and amenity value; those in such a condition as to make a significant contribution (>20 years is suggested).</p> <ol style="list-style-type: none"> 1. <i>Trees that might be included in the higher category but are downgraded because of impaired condition. (Remedial defects).</i> 2. <i>Trees and woodland forming part of a distinct landscape feature, but do not form essential components.</i> 3. <i>Trees with conservation or cultural benefits.</i> <p>C=Those of low quality and amenity value currently in adequate condition to remain until new planting is established (>10 years) or trees under 150mm stem diameter.</p> <ol style="list-style-type: none"> 1. <i>Trees not qualifying in higher categories.</i> 2. <i>Trees present in groups or woodlands but not with a significant higher landscape value and or offering low or temporary screening benefit.</i> 3. <i>Trees with limited conservation or cultural benefits.</i>

		Note: Category C trees will usually not be retained where they would impose significant constraint on development. Trees with a stem diameter <150mm could be considered for relocation.
11	Radius of RPA (m).	Root protection area (RPA) is the distance of circular protection zone is given in meters (m) calculated by multiplying the stem diameter given in column 4 by 12 in the case of single stemmed trees and 10 where multi-stemmed trees have been measured above the root flare.
12	RPA (sq. m).	The area of the RPA is given in square meters calculated by the formula As detailed in the British Standards.

Appendix 4: Arboricultural Method Statement:

**31 Ferncroft Avenue,
London,
NW3 7PG**

1.0 Scope of works:

- This stand-alone document provides a method for the protection of the trees, pre-development, during development and post development.
- This shall be displayed in a prominent place within the site office and all site users shall comply.
- This shall be read in conjunction with the **Timetable for Protection Works (Appendix 6)** and the detail of layouts are shown within the **Tree Protection Plan TPP (Appendix 4)**.

The main features of the method statement relate to:

- **Tree works as per tree management** proposals as detailed within the survey **Appendix 1** and shown upon the full **Appendix 4a TPP**.
- Please note no scoping information for wildlife considerations has been provided.
- Clearance of selected shrubs and trees from the site.
- The installation of tree protection fencing shall be as per BS5837:2012. The layout as detailed in full **Appendix 4a** tree protection plan (**TPP**) and be read as part of the timetable for tree protection works **Appendix 6**. The erection of the temporary fencing around the retained trees forming the construction exclusion zones (**CEZ**) as shown upon the **TPP**. The fencing prevents pedestrian or vehicular access to the **CEZ** and must only be removed once all construction is complete.
- The use of ground protection.
- The installation of future utilities. **Route to be determined**
- Tree planting and landscape planting phase. **Locations to be determined**

2.0 Timing of works:

The exact commencement date is not known, however the timetable provided gives the order that works shall be implemented to ensure trees are fully protected.

Tree and hedge removal and pruning works shall precede any other works. It is recommended that tree arising's be retained on site, Arisings to be used as mulch around newly planted trees or used as ameliorant into landscaped areas.

National Joint Utilities Group Volume 4 (Issue 2) shall be followed when trenching for services close to any trees. An **arboricultural watching brief shall be implemented during these works**. Utilities following installation shall be protected with tree root barriers if necessary. The scope of this remains outside of this report.

3.0 Individual tree protection:

Trees identified in **Arboricultural Impacts to Trees – page 6** require individual protection due to their proximity to construction traffic, this shall be carried out as per below.

- Encircle the tree in a double layer of hessian sacking from ground level to 1.8m, to be held lightly in place by cordage.
- Then encircle the tree with chestnut paling fencing from ground level to 1.8m on top of the hessian sacking and hold in place.
- Do not allow the fencing to come into direct contact with the tree bark as rubbing may occur causing damage to the tree.
- The individual protection shall remain in situ until the conclusion of the construction.

4.0 Ground protection during construction:

Ground protection shall be constructed per the weight of traffic entering or using the site without districting or causing compaction to the underlying soil.

This shall be constructed as below:

- a) *For pedestrian movements, a single thickness of scaffold boards over a raised scaffold frame so as to form a suspended walkway, or on top of a compression resistant layer such as woodchip to a depth of 100mm laid onto a geotextile membrane.*



- b) *For pedestrian operated plant, up to 2 t, proprietary, interlinked ground protection boards, placed on top of a compressive resistant layer (i.e. woodchip at 150mm*

depth) laid onto a geotextile membrane.



c) For wheeled, tracked construction traffic exceeding 2 tonnes gross weight an alternative system (i.e. proprietary systems or precast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice to accommodate the likely loading to which it will be subjected.

5.0 **Demolition**

Due to the potential presence of major roots within the area of development it will be necessary to break and remove the concrete by hand and then begin excavations using an air spade under the supervision of an Arboricultural Consultant until we can confidently ascertain the presence/extent of rooting in the area.

6.0 **Installation of Root Barrier**

The driveway will incorporate a cellular system (such as GreenBlue RootSpace) which allows maximum rooting area for the trees throughout the cells whilst providing strength and stability for vehicular access as well as eliminating the issue of compaction. The whole structure will be backfilled using a suitable planting medium such as Amsterdam Soil.

A root barrier (such as GreenBlue ReRoot 1000) will be used ***alongside/adjacent to the extension wall*** to restrict the eventual root spread towards the new extension as well as preventing chemical damage to the root system from contact with concrete.

7.0 **Driveway construction over tree roots to access property:**

Following the installation of the utilities using ground protection as above, the installation of a no dig construction driveway is to take place around the relevant trees as detailed in the full **Appendix 4d TPP**.

The majority of tree roots are within the top 600mm and their direction and spread are difficult to predict.

Root damage to trees and compaction of soil upon a development site may interrupt the flow of water and nutrients, cause decline, dieback and death and may render a tree unstable.

Therefore, roots must have oxygen for survival and large pore spaces within the soil which means better aeration. A no dig construction of the driveway with the use of a cellular confinement system that contains aggregate materials and makes them stronger and allows the depth of surface construction to be reduced. This sits over a geotextile layers at the subbase soil layer.

The driveway construction shall follow a **NO DIG** construction above the ground level and prevent **NO COMPACTION** to the soil. The passage of vehicles shall not take place into the root protection areas prior to the construction of the driveway.

Arboricultural Practice Note 12 and **Figure 4** below shall be referred too.

The excavation of soil within the RPA of trees for the installation of any hard surfacing shall be with hand tools of any turf layer and surface vegetation. Extra loading and ground protection shall be considered. The surface shall be constructed to avoid localized compaction. An impermeable barrier shall be installed to prevent contamination of the rooting area from deicing salt and or a geotextile shall be used at the base of the construction to prevent vehicle contamination pollution.

The hard surface shall be tolerant to root deformation and shall be set back from the tree stems by 500mm to allow for growth and movement. Gaps will be infilled with inert material. The use of a cellular confinement system as below is recommended.

Figure 4.

No tree roots shall be severed; no ground levels shall be raised with soil; no compaction via the tracking of vehicles

Engineered solution:

- Geotextile layer installed between layers allowing water to pass through but stops different materials mixing. The base level geotextile shall be of a standard to prevent contaminant leakages.
- Load bearing 3 dimensional cellular systems to spread the weight and support over soft grounds. The load bearing specification of the cellular system shall be for light vehicle standards.
- Edge containment such as peg boards or sleepers to prevent the structure creeping.
- No fines granular subbase.

Method:

- Installed during dry weather in summer months when the ground is least prone to compaction.
- Surface vegetation killed of beforehand with herbicide. The dead material cleared. Monitored by the arboriculturist.
- Construction from the entrance of the site and roll out in front of machinery.
- Any tree stumps to be ground out.
- Fill any hollows with clean sharp sand. **Do not grade off.**
- Geotextile with contaminant prevention standards before cellular system and secure the cellular load spreader with pins. (Examine for utility conflict).

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- Edge the system and infill with a subbase being a no fines aggregate incrementally and compact.
- A subsequent geotextile shall be installed to prevent merging with the surface materials and as surface cellular system infilled with gravel.

Highway entrance:

Subject to local authority this may be an apron or a sealed surface to prevent the loss of driveway materials onto the road.

It is recommended that a geotechnical engineer be consulted regarding the load bearing qualities of the cellular system.

8.0 Special Engineered Foundations within the RPA: If tree roots found during excavation

Traditional strip footings will cause extensive root loss and shall be avoided.

Specialist foundation design shall be used, and cross section levels will be agreed.

Root excavation pre-piling shall be carried out by an onsite optimal investigation with hand tools and/or with an air spade. This is to a minimum depth of 600mm in order to avoid damaging roots during foundation construction required for tree stability. This shall precede the installation of piles or beam foundations. This shall be carried out to determine the extent of the tree roots over the proposed development area and then the layout and extent of the piles as shown in Appendix 4A.

The foundation slab shall be constructed with a ventilated air space beneath to enable gaseous exchange with the soil surface.

Roof run of shall be re-directed under the slab.

Load bearing properties of the soil shall be considered. I recommend a structural engineer's input such. Consideration for soil shrink ability shall be made to reduce the risk of indirect damage. The engineered pile solution produced that mitigates the risk of future direct impacts of tree root expansion during growth.

Building control shall oversee foundations where topsoil is retained and where roof run-off is under the foundation slab.

Piling shall be with the smallest practical pile diameter as this reduces the size of the rig and reduces the risk of striking major tree roots.

The piling mat on which the pile rig sits shall conform to the ground protection specifications as at 8.

Piles shall be sleeved bored piles or screw piles to prevent tree root toxicity damage of uncured concrete.

9.0 Basement/subterranean construction within the RPA:

Consideration for drainage run control system from the basement extension to avoid a perched water table above the basement

10.0 The Installation of Hard Surfacing:

No construction or installation of hard surfacing shall take place within the root protection areas (RPA) of the trees without consultation with the nominated arborist.

11.0 Contractors Car Parking and Storage of Materials:

Car parking and the storage of materials shall be outside the influence of any tree. The locations shall be selected upon **Appendix 4 TPP** and shall be based upon phasing the development.

These locations may be altered subject to consultation with the nominated arborist as the development progresses. I recommend these areas are contained within fixed Heras fencing boundaries.

12.0 On Site Storage of Spoil, Building Materials and Toxic Materials:

Prior to and during the construction, materials and plant shall **not** be stored within or adjacent to any root protection areas.

Oils, chemicals and fuels shall be stored on an impervious or membraned impervious surface and shall be surrounded by bunds to prevent leakage. No fires or mixing of materials shall take place near trees.

13.0 Arboricultural Supervision and Aftercare:

Supervision throughout the construction phase shall be by a nominated arborist who is responsible for written consultation with the local authority tree officer. They shall attend pre-development for a TOOLBOX talk with contractors.

Documented dated site visits reporting findings to the tree officer and liaising with the main contractor. The frequency shall be based upon the level of activity.

On completion of the works the trees shall be inspected by an arborist to determine their condition and advise of any remedial works if necessary.

14.0 Contact Details:

Arborist: Michael Barker, T: 01603 487447 E:info@aceofspadesgardens.co.uk

Tree officer: London Borough of Camden



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Architect: Sanam Lakhi Architectural Designer E:s.lakhi@xularchitecture.co.uk
XUL Architecture T: 020 7431 9014 | 07574 19521

Contractor: Unknown

Client: Jaipooja Choraria & Nikhil Choraria E:jaipoojashah@gmail.com

Appendix 5: Timetable for Tree Protection Works – 31 Ferncroft Avenue, London NW30 7PG

	OPERATION	BEFORE CONSTRUCTION WORKS BEGIN	DURING CONSTRUCTION WORKS	UPON COMPLETION	SIGNED OFF		
					ARBORIST	ENGINEER	CONTRACTOR
1	Install individual tree protection as per the method statement Appendix 5. Arboriculturist to monitor, check and record this process. This shall remain in-situ until the conclusion of the construction.	X	X	X			
2	Install ground protection as per BS5837:2012 and detailed upon TPP Appendix 4 . This shall remain in-situ until the conclusion of construction. As per Appendix 5 .	X					
3	Demolition as per BS5837:2012, detail as per method statement Appendix 5. Arboriculturist to monitor, check and record the process.	X					
4	Installation of cellular tree planting system and root barrier as per the method statement Appendix 4 Arboriculturist to monitor, check and record the process.		X				
5	Construction of a no dig Cellular system The location of the section as detailed upon Appendix 4 tree protection plan TPP. Cellular confinement system method as detailed in the arboricultural method statement Appendix 4 Arboriculturist to monitor, check and record this process.		X				



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	OPERATION	BEFORE CONSTRUCTION WORKS BEGIN	DURING CONSTRUCTION WORKS	UPON COMPLETION	ARBORIST	ENGINEER	CONTRACTOR
6	Specialist engineered foundations. Basement excavation Detail as per method statement (Appendix 4) and conditioned as part of planning with engineered method. Arboriculturist to monitor, check and record this process.	X	X				
5	Check condition of the protected trees and consider if remedial works are necessary with engineered method. Arboriculturist to monitor, check and record this process.			X			
6	Arboricultural supervision and advice including site visits during the works to check and liaison with the Local Planning Officer.	X	X	X			
7	ALL WORKS COMPLY WITH BS5837:2012 Trees in Relation to Construction	X	X	X			

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Appendix 6 – Site Images



Photo 1: T001 – London Plane



Photo 2: Damage to neighbours gate post and wall

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Photo 3: Brick pillar leaning towards pavement



Photo 4: Damage to wall corner and brick pillar in relation to tree

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Photo 5: Cracking of wall corner

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Appendix 7:No dig driveway close to tree roots

