BY APPOINTMENT
TO HER MAJESTY THE QUEEN
TREE SURGEONS
F.A. BARTLETT TREE EXPERTS CO. LTD.

Bartlett Consulting

London Borough of Camden
5, Pancras Square
London
N1C 4AG

Date: 21st May 2015
Our Reference: JM/150261L/sh

Dear Sir/ Madam,

Re: Boundary between Jockey's Fields and Raymond Buildings: Letter to accompany notification to carry out works to trees within a Conservation Area.

In reference to recent site investigations and assessment of the current damage together with safety bracing supports to the boundary wall, located between Jockey's Fields and Raymond Buildings, Honourable Society of Gray's Inn; this letter details works to be carried out to specific trees adjacent to the structure.

Introduction

The subject boundary wall is Grade II listed and currently suffering from damage in the form vertical cracking, separation of brickwork, lateral movement and in places excessive lean. The extent of the damage is such that some rebuilding and strengthening is required.

Previously liaison with the London Borough of Camden resulted in the installation of metal safety bracing to the northern end of the damaged boundary wall. The bracing is temporary and was added for safety reasons, until a more permanent solution was reached. A separate Planning & Listed Building Consent Application submission to the London Borough of Camden has been made on the 18th May 2015, ref - 4141682, which includes: a Design and Access Heritage Statement by GHK Architects, reference - 2135/3.1, Arboricultural Method Statement and Tree Protection Plan by Bartlett Consulting, reference – JM/150272R.

This letter has been prepared to notify the London Borough of Camden of the intention to carry out works to the trees adjacent to the damaged boundary wall.

Background

It has been established that the damage is concentrated in three separate sections along an approximately one hundred and sixty metre length of the boundary wall.

Background (Continued/…)

Since the site investigations, remedial works for the boundary wall have been specified by the Structural Engineer, which in two specific areas includes the careful removal of the top 750 millimetres of brickwork to be subsequently re-constructed vertically using a plumb line. The section of boundary wall to the north has been previously temporarily strengthened with metal safety bracing but now requires re-stitching and repairs, to improve stability of the cracked and disrupted brickwork. Outside of these main three areas of remediation, repair will mainly involve re-pointing of the brickwork.

Following the investigation works, the Structural Engineer is of the opinion that the lower section of the wall at the northern end, currently stabilised by temporary metal safety bracing has been subject to lateral and possibly upwards movements caused by those roots emanating from the three adjacent trees (T600, T601 and T603). Also, the Structural Engineer considers that future relative displacement of the above and below ground sections of wall to be of concern, should there be further lateral root pressure and movement. He recommends that these three trees are reduced in height and managed, in order to drastically slow down the further root growth and pressure on the wall.

Elsewhere the remainder of the wall is reported to be subject to some gentle, but progressive curvature over the height of the wall, which is leaning outwards, to Jockey's Field. This has been caused mainly by age and the prevailing wind/weather conditions rather than specifically related to trees or foundation problems. The Structural Engineer considers that there is a possibility of foundation damage being caused by pressure and disturbance from root growth. However he has stated that this only appears to have occurred at the northern end of the wall, where there is a dense cluster of trees (T600, T601 and T602).

Discussion

Direct damage to a structure can occur through incremental growth of the main stem and main structural root system. Equally roots that may have grown against the wall and below the foundations may move within the soil, corresponding to above ground movement of the trees in winds, transmitting the rocking movement onto the structure (Roberts. J, Jackson. N, Smith. M. 2006, 'Tree Roots in the Built Environment', TSO, Norwich). This can result in direct damage to built structures, such as the brick boundary wall in question.

The investigations previously carried out established that roots from the tree are both growing against and beneath the foundations of the boundary wall. When referencing BS5837:2012 ' Trees in relation to design, demolition and construction – Recommendations' the minimum distance recommended between a masonry boundary wall and a tree with a stem diameter in excess of 600 millimetres at maturity to avoid direct damage is 2.0 metres. All of the mature specimens adjacent to the boundary wall, namely T600, T601, T606, T607, T608, T609, T610 and T611 have stem diameters in excess of 600 millimetres and are located within 1.0 metre of the boundary wall. Thus according to published recommendations, direct damage to the wall may be expected.

Following Arboricultural supervision and investigations while the trial pits were excavated, we concur with the Structural Engineer that the trees are likely to be contributing to damage to the boundary wall.

It is further considered that reducing the trees in height and lateral spread will reduce their wind-sail and as a consequence reduce the energy transmitted through the stem and into the base and roots. The effect will be to reduce their potential to move and sway in the wind thus decreasing the corresponding movement of roots in the soil and against and underneath the structure. It is primarily for this reason that crown reduction of the trees is recommended.

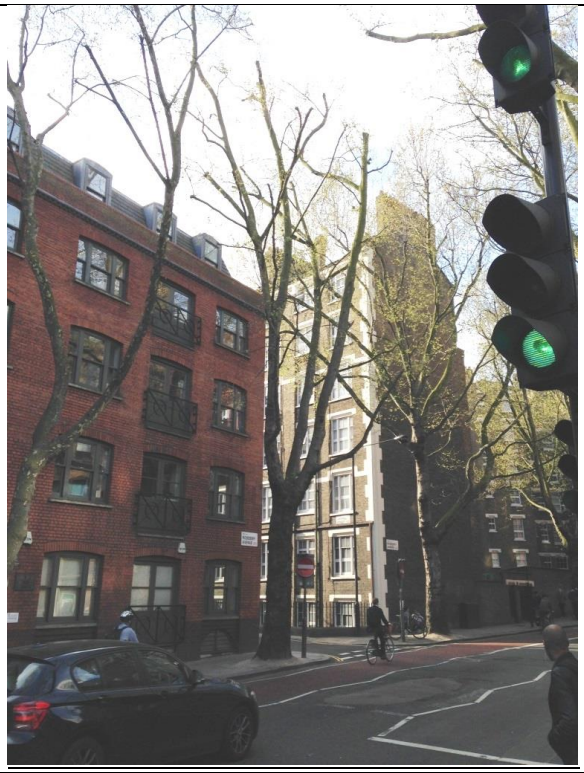
Discussion (Continued/…)

Growing trees maintain a balance between the size of the above ground shoots and below ground roots system. Removal of shoot biomass by way of a crown reduction raises the previously established root to shoot ratio. Thus following any crown reduction, changes in carbohydrate allocation will result in crown regrowth and reduced root growth. This situation however, is short-lived and studies have recorded that the root: shoot balance re-stablished within 3 – 4 months (Roberts. J, Jackson. N, Smith. M. 2006, 'Tree Roots in the Built Environment', TSO, Norwich). As such, there is potential for some slowing down of the growth of the root system but this will be incremental and subject to the trees being re-reduced on a regular cycle. The intention would be to maintain the trees at reduced dimensions with a reduced shoot biomass

The trees in question, all London Plane, T600, T601, T602, T607, T608, T609, T610 and T611 are a component of approximately 110 trees located within the curtilage of the site at Grays Inn and differ from the majority as they are growing a street environment. The wider grounds at the site include extensive managed gardens, open to the public, where the bulk of the trees are located.

Several of the trees contemporary with those mature trees that remain adjacent to the damaged boundary wall have been previously removed as a result of poor condition and structural weakness, including heart-rot decay. Within Gray's Inn Gardens (The Walks) at the site there is a history of 'Honey Fungus' (*Armillaria spp*) colonization of the London Plane trees, which has resulted in the failure of at least one large mature specimen, at ground level. As part of on-going inspections, the trees are subject to non-invasive decay detection tests and the lean of their main stems are routinely measured. It is considered that reducing the crowns of the trees located adjacent to the boundary wall, would potentially increase the length of time the trees can be safely retained.

Visiting the streets in close proximity to Grays Inn, reveals early mature to mature London Plane trees maintained as high pollards. The photograph overleaf shows an example of this.



Photograph one – Showing high pollarded trees in the nearby Roseberry Avenue.

Discussion (Continued/…)

It is considered appropriate that the trees adjacent to the damaged boundary wall are now managed on a similar regime to those in the local street environment. Whilst high pollarding the trees will alter their appearance, it would allow the trees to be retained and reduce the future risk of direct damage to the Grade 2 listed boundary wall. Implementing a high pollarding regime would not be out of keeping with the London Plane trees located in the local street scene and the trees would remain with impressively large dimensions.

The trees T600 and T601 are mature specimens and located adjacent to the greatest extent of damage to the wall. T602, a younger replacement planting is currently of less concern due to its smaller dimensions. It would appear prudent at this stage to high pollard T600 and T601 to reduce future risk of damage to the boundary.

T606, T608, T609 and T610 are located adjacent to the two wall sections that are subject to outward leans in the direction of Jockey's Fields so will require repair in the form of rebuilding. Whilst the Structural Engineer has not attributed damage to these sections of wall with the adjacent trees, high pollarding would reduce future risk for the reasons detailed above for T600 and T601. Managing T606, T608, T609, T610 and T611 as high pollards as for T600 and T601 would also maintain a more cohesive group. The recommendations for the trees differ slightly as a result of the variance in their heights and the effort to maintain a cohesive tree group.

T602 and T607 are younger specimens with smaller dimensions and therefore it is not considered expedient at this time to conduct high pollarding.

	
Photograph two – Showing the trees adjacent to the northern section of the wall; T602 is at the front and T601 and T600 behind.	Photograph two – Showing the T606 in the foreground and T607 – T611 behind.

SITE PLAN

This section of wall is subject to the greatest extent of damage, and is currently receiving extra support from bracing. Repair will include re-stitching of the cracked brick work to improve stability.

The two sections of the boundary wall subject to outward leans toward Jockey's Fields to the west. Repair will include removal of the top 750 millimetres of brick-work, which will be cleaned and then re-used to rebuild the wall vertically plumb.

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Site	Honourable Society of Grays Inn – Boundary wall between Jockey's Fields and Raymond Buildings.
Drawing Title	Sketch Plan
Reference	JM/150261L/sh
Date of Survey	13th May 2015
Scale	Not to scale
Drawn	JM
	Indicative North ↑

RECOMMENDATIONS

- All works will be carried out in accordance with B.S.3998: 2010 Tree Work - Recommendations.

Tree Number	Species	Schedule of works
T600	London Plane	High pollard by reduction in height by approximately 5.0 metres and reduction in lateral spread by approximately 3.0 metres to balance. Re-reduce back to pruning points on a three year cycle.
T601	London Plane	High pollard by reduction in height by approximately 5.0 metres and reduction in lateral spread by approximately 3.0 metres to balance. Re-reduce back to pruning points on a three year cycle.
T602	London Plane	No works presently required.
T606	London Plane	High pollard by reduction in height by approximately 5.0 metres and reduction in lateral spread by approximately 3.0 metres to balance. Re-reduce back to pruning points on a three year cycle.
T607	London Plane	No works presently required.
T608	London Plane	High pollard by reduction in height by approximately 3.0 metres and reduction in lateral spread by approximately 2.0 metres to balance. Re-reduce back to pruning points on a three year cycle.
T609	London Plane	High pollard by reduction in height by approximately 3.0 metres and reduction in lateral spread by approximately 2.0 metres to balance. Re-reduce back to pruning points on a three year cycle.
T610	London Plane	High pollard by reduction in height by approximately 3.0 metres and reduction in lateral spread by approximately 2.0 metres to balance. Re-reduce back to pruning points on a three year cycle.
T611	London Plane	High pollard by reduction in height by approximately 3.0 metres and reduction in lateral spread by approximately 1.5 metres to balance. Re-reduce back to pruning points on a three year cycle.

Yours sincerely,

Jason Mills
Arboricultural Consultant