

Consulting Structural Engineers and Party Wall Surveyors

Martin Gustyn and Associates Ltd.

69 BROOKFIELD ROAD, CHISWICK W4 1DF M: 07878466575 E-MAIL: martin@gustyn.com
VAT NUMBER: GB140 6185 35

Mrs Lydia Forte
Warwick Lodge
42 St. George's Drive
London
SW1V 4BT

Our Ref: 23984/ MG
22 February 2024

RE: WARWICK LODGE, 42 ST. GEORGE'S DRIVE, LONDON SW1V 4BT – STRUCTURAL INSPECTION OF DAMAGED BOUNDARY WALL TO THE NORTH SIDE OF ST. GEORGE'S DRIVE

CLIENT BRIEF

To visit the property and visually inspect the garden wall to the North side of St. George's Drive ('the boundary wall') and report on the structural integrity of the boundary wall, especially in light of severe cracking that has occurred to this wall over the past years.

This report is intended for the use of the Client, Mrs Lydia Forte and no liability can be accepted for use by any third party.

VISIT:

The day was bright and clear. Access to the property was provided on the 1st February 2024. The boundary wall was inspected from St. George's Drive street level as well as from the garden side of Warwick Lodge.

One trial-pit TP1 was excavated against the boundary wall from the garden side of Warwick Lodge and the results of trial-pit excavation can be found in Appendix 1, drawing SK-01 rev.P1.

BOUNDARY WALL CONSTRUCTION & NEARBY VEGETATION

The boundary wall is constructed of a 9" (~230mm thk) brickwork supported on a stepped brick corbel foundation.

The wall is approximately 2311mm high above the street level with decorative bottleneck pillars on top. The wall was rendered from both sides using minimum 25mm cement render.

The boundary wall foundation is approximately 552mm below the street level.

There is an adjacent tree 'T1 – Tree of Heaven' (Height = 19m, Stem diameter = 580mm) within a close distance of less than 100mm from the boundary wall. Refer to 'Tree Damage Assessment' prepared by Dominic Blake of ATS dated January 2024 for location of the Tree and his recommendations.

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According to British Geological Survey Map, the ground conditions in the area are London Clay Formation (Clay and Silt), therefore the ground conditions are susceptible to movement due to seasonal moisture changes in the ground and tree roots.

VISIBLE DEFECTS & OBSERVATIONS

1. The T1 – Tree of Heaven's trunk as it is located less than 100mm from the boundary wall which is clearly pushing against the wall which is causing the boundary wall to crack and rotate.
2. A trial-pit excavation (TP1) some revealed some small diameter tree roots and one large 140mm diameter tree root which is pushing against the wall (**photograph 1**).
3. There are several cracks ranging between 5mm to 23mm along the boundary wall in a close proximity to the Tree T1. These are structural cracks (**photographs 3,4,5**).
4. The boundary wall is leaning by approximately 3 degrees towards the street. (92mm horizontal distance over a wall height of 1485mm, which exceeds tolerable amount of movement (**photograph 4**).
5. The bottleneck pillars have collapsed on the floor and are temporary stored in the garden .
6. The boundary wall shows signs of historic render repairs (**photograph 3**)
7. The garden level is approximately 510mm higher than the pavement level. The difference of ground levels is influencing the wall to rotate towards the pavement.

RECOMMENDATIONS

The close position of the existing Tree of Heaven from the boundary wall and an evidence of one very large diameter tree root touching the wall provide the main evidence that the fundamental reason behind the wall leaning is presence of the tree which is pushing against the wall.

The leaning of the wall in excess of 92mm is considered as structurally unsafe as the resulting centre of gravity of the wall is outside of the centre of gravity of the foundation and the wall might continue to rotate and collapse onto the pavement with no additional warning to pedestrians. A heavy gust of wind might accelerate the process of a wall collapse in the future.

Based on the evidence of this inspection the movement and subsequent cracking is currently causing structural instability. In accordance with *BRE Digest 251: Assessment of damage in low-rise buildings with particular reference to progressive foundation movement* the cracking can be generally classified as category 3 to 4 [cracks 5mm to 25mm]. We attach the relevant section of this BRE Digest for your reference.

On this basis we would therefore recommend:

1. Fell and grind the Tree of Heaven. All works should be undertaken under a strict supervision of the Tree Specialist. A permission from the Local Westminster Council will need to be sought.

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2. Rebuild the damaged section of the boundary wall. The boundary wall will need to be designed as a retaining wall capable resisting forces from the raised level of the garden wall. The exact specification of the retaining wall, repairs and new foundation is not within a scope of this report.
3. Filling of the small cracks less than 5mm thick with flexible waterproof filler.
4. Not to increase the garden level with a horizontal distance of 1m away from the boundary wall with the addition of a top soil or other heavy vegetation in the future.

Furthermore it is important to establish whether the movement to the remaining section of the boundary wall has now ceased, whether it is ongoing and worsening or whether it is fluctuating on a seasonal basis. As a result we also recommend:

1. A plumb survey should be made to record the current alignment of the entire boundary wall. A further survey can then be made perhaps in 2-3 years time in order to determine the nature of any ongoing movement.
2. A series of 'tell-tales' should be set-up across the boundary wall (from both sides of the boundary wall) in order to ascertain further movement. These should be monitored on a quarterly basis over a period of 2-3 years in order to determine the nature of any ongoing movement.

I trust the above report is self explanatory. Should you have any queries, or require further comment or clarification, please do not hesitate to call me.

Yours faithfully,



Martin Gustyn BSc(Eng) MFPWS
Director
For Martin Gustyn and Associates Ltd.

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Extract of BRE digest 251

Table 1 Classification of visible damage to walls with particular reference to ease of repair of plaster and brickwork or masonry

Crack width is one factor in assessing category of damage and should not be used on its own as a direct measure of it.

Category of damage	Description of typical damage <i>Ease of repair in italic type</i>
0	Hairline cracks of less than about 0.1 mm which are classed as negligible. <i>No action required.</i>
1	Fine cracks which can <i>be treated easily using normal decoration</i> . Damage generally restricted to internal wall finishes; cracks rarely visible in external brickwork. Typical crack widths up to 1 mm.
2	<i>Cracks easily filled. Recurrent cracks can be masked by suitable linings</i> . Cracks not necessarily visible externally; <i>some external repointing may be required to ensure weather-tightness</i> . Doors and windows may stick slightly and <i>require easing and adjusting</i> . Typical crack widths up to 5 mm.
3	Cracks which <i>require some opening up and can be patched by a mason</i> . <i>Repointing of external brickwork and possibly a small amount of brickwork to be replaced</i> . Doors and windows sticking. Service pipes may fracture. Weather-tightness often impaired. Typical crack widths are 5 to 15 mm, or several of, say, 3 mm.
4	Extensive damage which <i>requires breaking-out and replacing sections of walls</i> , especially over doors and windows. Windows and door frames distorted, floor sloping noticeably*. Walls leaning or bulging noticeably*, some loss of bearing in beams. Service pipes disrupted. Typical crack widths are 15 to 25 mm, but also depends on number of cracks.
5	Structural damage which <i>requires a major repair job, involving partial or complete rebuilding</i> . Beams lose bearing, walls lean badly and require shoring. Windows broken with distortion. Danger of instability. Typical crack widths are greater than 25 mm, but depends on number of cracks.

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PHOTOS – further photos were taken, and are available on request.



Photograph 1: Trial-pit TP1 – Garden Side

140mm dia tree root

Small diameter roots

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Photograph 2: Boundary wall view – Garden Side

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Photographs 3,4,5: Boundary wall view – Street view.