

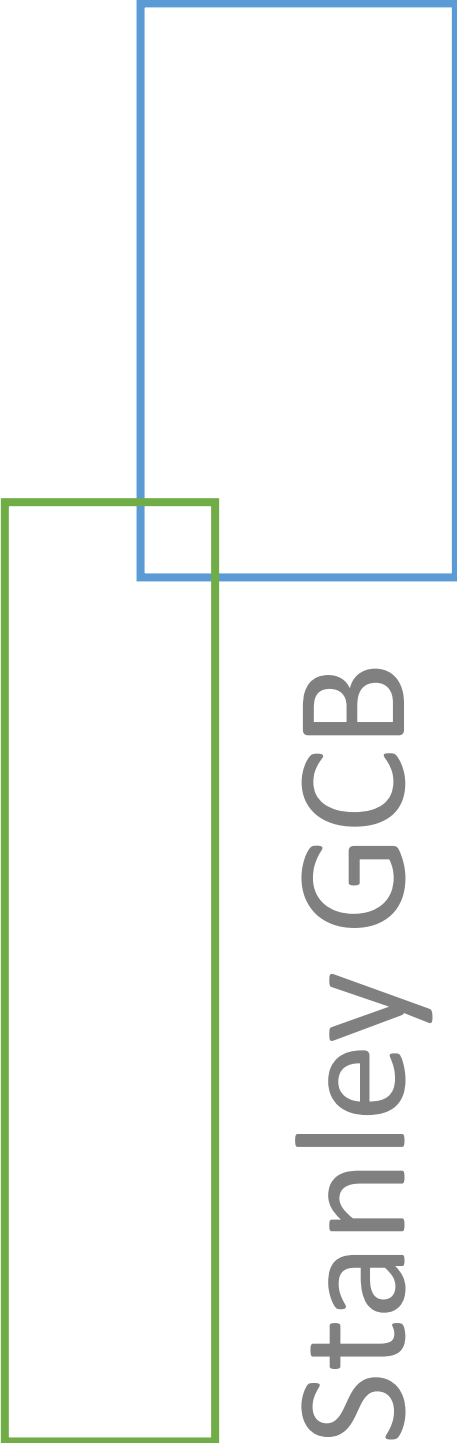
Title Listing Wall Assessment

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Client Jonathon Perez

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Stanley GCB

Structural Engineering

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Introduction

The low-level party wall between 56 High St and 58 High St is listing. The properties are roughly 400 years old.

Planning permission has been submitted to rebuild the wall.

The Planning and & Consents team have requested a structural report to support the application, in relation to the listing wall.

Purpose of this Document

This document is to provide an assessment of the low-level party wall between 56 High St and 58 High St. Following the assessment, provide a method of construction to prevent further listing.

Executive Summary

The wall is listing significantly and poses immediate danger to life.

The wall will suffer from complete catastrophic failure of its structure if no action is taken.

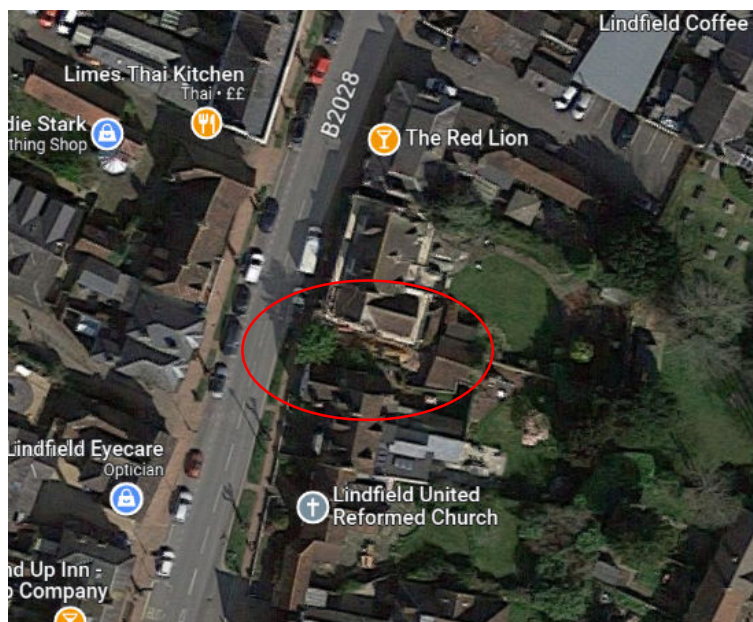
The collapse will not only lead to brick and mortar wall falling into the alleyway down the side of 56 High St, but also into the public walkway and may lead to the Western wall along the frontage of 58 High St to collapse onto the public pavement.

This failure will cause damage to the 400 year old building and potentially loss of life if a person or persons are in the immediate vicinity of the wall when the failure occurs.

Evaluation

Location

The site is located in Lindfield, West Sussex on the B2028, Lindfield High St. The wall is situated between residential properties 56 and 58 High St.



The surrounding area is 43m above sea level and is situated on a hill with approximately 1.69 degrees fall.

The average annual precipitation in the UK typically ranges from approximately 800 mm to 1,400 mm. The annual precipitation in Lindfield is 763mm annually and is therefore below UK average.

56 High St is to the South of the wall on the lower side, approximately 1.4m from the main building of 56 High St, with brick paving covering the entire alleyway running the length of the wall adjacent to the building.

58 High St is to the North, on the higher side of the wall and 6m from 58 High St. The immediate ground adjacent to the wall is an open bed with shrubs running the length of the wall and established magnolia tree to the Western end.

The wall runs East - West between the two properties and is mainly in the shade.

Construction & Condition

The specific age of the wall is unknown, but it is understood to be over a century.

The main section of low-level wall is constructed from brick and mortar, with a half round curved coping brick capping the wall, as seen in the image below.



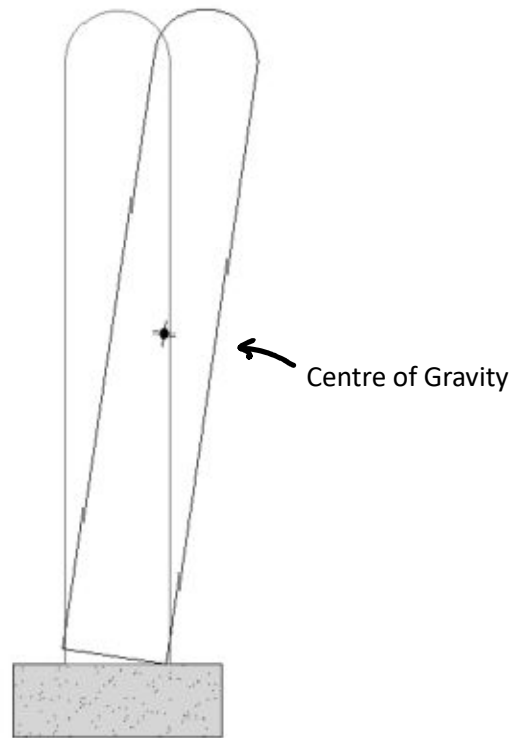
Constructed to a height of 1.35m, measured from the southern side of 56 High St and 15m in length, with a 1.4m return to the Eastern end.

To the front of 58 High St, the wall has been constructed to a height of approximately 2.05m and can be seen to envelop the smaller original party wall, please see image below.



Without excavation it is impossible to evaluate the type of foundation or its physical state.

The wall is listing at an average angle of 8.7 degrees toward the South.



The 1.35m wall is listing to 8.7 degrees.

The wall is listing to a point where its centre of gravity is at the edge of its boundary and is at the edge of the mass of the wall.

Conclusion

The low-level party wall has suffered from various factors leading to its current condition. Its location, construction, surroundings and age, have all contributed to this.

- The ground level on the North side of the wall is higher than the south side, creating a minor imbalance of pressure on the wall.
- The lack of water pipe drains or weep holes in the construction of the wall, allowing water to build up on the North side of the wall, with nowhere to escape. This has generated unnecessary hydrostatic pressure on the wall and most likely saturation of the bricks;
- The later addition of the higher wall on the frontage of 58 High St has not been tied into the existing wall properly. The mortar bonding these two walls together has now completely failed, leading to a significant gap and failure of the structural support.
- The magnolia tree is likely putting pressure on the wall. It can be seen that there is growth against the exposed section above ground.

Without removal of the shrubbery on the North side of the wall, it is not possible to fully assess this side of the wall. However, it is clear that the lack of proper construction of the larger wall and the magnolia tree has caused significant pressure, ending in a failure of the wall.

The wall is listing to a point where its centre of gravity is at a tipping point, relying only on the adhesive qualities of the remaining mortar.

At this point further investigation is not recommended, as it clear to see the danger of this wall collapsing and its need of re-construction.

Re-Construction Recommendations

In order to prevent the wall from suffering from the same failures. There are some minor changes in the construction that are advisable. The reconstructed wall will be of enhanced design and will provide it with a greater degree of inherent strength, whilst retaining its historic appearance.

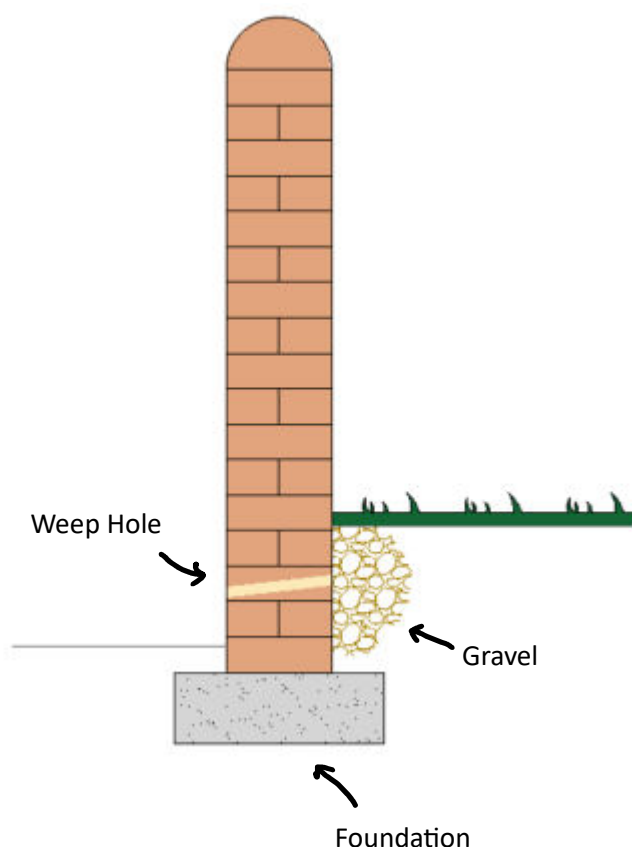
Following careful dismantling of the wall and safe storage of the bricks, re-building of the wall can be done.

The wall is a mass retaining wall. The height of a retaining wall should be no more than 4 times the thickness. This wall must remain in keeping due to its heritage, limiting the wall thickness to a single brick. For a single 22.5 cm (9 inch) brick wall, this limits the height to 90 cm (36 inch). However it is noted this would be to retain soil to the full height of the wall, which is not the case here. It is therefore structurally acceptable to construct the wall from a single brick width to the original height of the wall at 1.35m.

As there is part of the wall that is retaining, water pipe drains or weep holes are advisable. This should be combined with gravel backfill on the higher side of the wall. The gravel to come up to a height of 150cm below ground level.

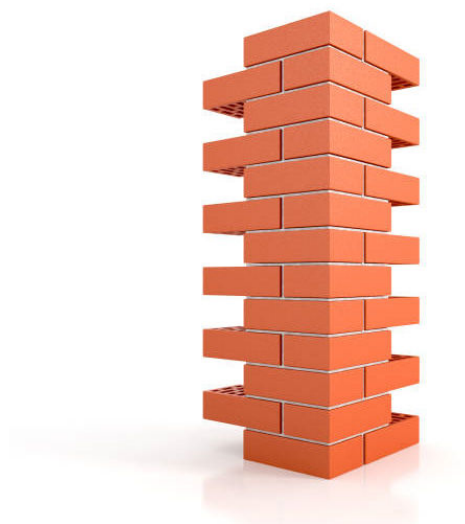
For a wall of 1 brick width, general practice calls for the foundations to be 45cm wide. This would be expected here.

Below is a sectional illustration of this.



Example of Expected Construction

It is also advised where the party wall and the front wall of 58 High St meet, the corner of the wall be tied together to prevent the separation that has previously occurred. Please see example below.



END

Attachments

Document Title	Document Number	Rev
Existing Ground Floor Layout	56HS-001 E-21	02