

Our ref: JH 21-4569
Your ref:



Report for:
Mr R McGregor

Regarding the Structural Inspection of:
1 Chatsworth Grove
Manchester
M16 8GY



Date of inspection: 9th March 2021

Date of report: 11th March 2021

The **Institution**
of **Structural**
Engineers

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1. Brief.

To undertake a visual inspection of the property to comment upon the distortions noted to the gable wall and advise accordingly.

2. Type of Report:

This report is a visual inspection of the main structural elements of the building in question paying particular reference to any structural defects apparent.

3. Limitations.

This report is based upon a visual inspection of the building and limited to the aspects mentioned above and which we consider to be relevant to the stability of the building at the time of our inspection.

Our observations are not meant to be a detailed condition report of the building and only the relevant structural issues are addressed.

Where the property is furnished and occupied, we have not lifted carpets or moved furniture as this is beyond our service. Also, we have not lifted any floor boards to inspect voids beneath unless traps are provided and easily accessible. Where necessary as part of the brief, and where access is available, we will inspect roof voids for structural conditions however depending upon the ceiling heights and ease of access, only a 'head and shoulders' inspection may be possible thus limiting our overall survey. Where we consider further investigations are warranted then we will advise accordingly.

Our inspection is made from ground level and where applicable using a Surveyors ladder. Comments made of roof coverings or chimneys are made from this vantage point and it is the client's responsibility to obtain all necessary specialist reports covering these.

This report does not cover any aspects relating to damp ingress, services, drainage or covered elements. No investigations have been undertaken to determine foundation depths or conditions unless we have included this in our brief and a suitable contractor has attended site with us to ascertain such details.

Our observations are reported as one is standing at the front of the building looking towards the front elevation.

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4. General details:

The property is a south facing, three storey four bedroom left hand side semi detached house built in the 1920's of traditional masonry construction with suspended timber floor construction, under a slate covered timber rafter and purlin pitched roof structure.

The surrounding levels tend to be level.

The immediate area tends to be of residential usage.

The British Geological Maps show that the underlying soils are of Glaciofluvial sands and gravels overlying Wilmslow Sandstone formation.

5. Observations:

1. Externals

The gable elevation is built of brickwork laid stretcher bond, although a header course is noted up at second floor level.

The wall starts at paving level, which is approx. 1m above the basement level of the house. Therefore the ground floor is some 1200mm above the paving level.

The wall bulges outwards at ground floor level by between 10 and 55mm in 1200mm reducing at the front and rear corners and worse in the middle.

The wall then leans back inwards towards first floor level.

The wall bulges outwards between first and second floor level by some 30mm in 1200mm.

The wall leans back in towards the roof line.

There is a window opening at second floor level.

Two chimney structures are noted to the roof line – one to front and one to the rear. these have been capped off but vegetation is seen growing out of the masonry.

The wall has been repointed previously – approx. 13 years ago and no cracking etc is apparent to the main wall, however vertical cracking is noted along the junction with the previously rebuilt garden wall to the rear.

Slight horizontal displacement is noted to the rear return – over the kitchen door/window opening.

No apparent distortions are noted to the front elevation.

2. Internals

At basement level there are two chimney breasts on the gable – one front and one rear.

The wall to the front chamber is relatively plumb.

The basement is open plan with a steel beam supporting the main internal division wall between the front and rear rooms above. The ground floor to the front spans into the gable wall, whilst the ground floor to the rear spans parallel.

The wall to the rear chamber leans outwards just below floor level.

An external door is noted in the rear left hand corner tight against the gable wall.

At ground floor level is the front lounge and kitchen to the rear. The wall in both rooms seem to have been dry lined previously.

There are chimney breasts as part of the gable wall in both rooms.

The wall to the front lounge leans inwards slightly although no distortions are apparent to the wall/ceiling junctions in the front living room. The wall in the kitchen leans outwards to the rear corner at high level. Cracking is noted to the head of the kitchen door and window opening to both left and right hand sides.

At first floor level, there is the front and middle bedrooms divided by a brick wall.

Distortions are present around the front corner of the front bedroom to the wall/ceiling junction.

The wall to the rear bedroom leans outwards upto second floor level above.

The first floor would appear to span side to side.

At second floor level is the attic bedroom.

The wall leans inwards upto roof level by 15-20mm in 1200mm.

The window sill slopes down to the front by 10mm.

The second floor would appear to front to rear.

Timber purlins support the roof over the bedroom – spanning side to side.

6. Discussions:

The property was built in the 1920's of traditional masonry construction with suspended timber floors all under a timber rafter and purlin roof construction all covered with slates. The house is elevated above external ground level by approx. 1m.

We understand that the current owners have owned the property since 2007 although the house has been in the family and Mrs Smith was brought up in the house as a young child.

The property was updated at this time including repointing the gable elevation and rebuilding part of the garden wall to the rear.

The wall is clearly distorted and can be seen as you stand at the entrance to the alleyway at the front of the house.

On closer inspection the wall bulges outwards at ground floor level which is elevated by some 1m above the external ground level. The wall then leans back inwards towards first floor level then back out above this level before leaning back inwards along the roof line.

The wall is built of brickwork laid stretcher bond upto second floor level suggesting two leaves of masonry with a cavity between. This is to prevent the passage of moisture between the two leaves in an effort to prevent damp ingress to the internal finishes. Above second floor we suspect this changes to solid construction – shown by the header course of bricks. This is normal construction for this age of property.

The internal finishes at ground floor appear to have been formed with plasterboard 'dry lining' that we presume has been used to cover the distortions to the wall. At first floor level though, the original wall finish is noted and distortions apparent around wall/ceiling junction.

From our inspection, we consider that the outer leaf of the wall has separated from the inner leaf. Normally, they would be tied together with steel ties – or in this case due to age, wrought iron ties. These ties corrode and snap resulting in the two leaves of brickwork separating.

The wall is also a very tall slender section and although stiffened by the two chimney breasts to the front and rear rooms, is susceptible to flexing under the relative weight of the structure supported. In this case, the floors built into the wall will provide lateral restraint whilst the floors running parallel do not.

The door openings to the rear return reduce the resistance of lateral movement to the wall, allowing further displacement to occur. This is shown by the cracking to the side of the rear ground floor door opening.

Overall, we consider that the wall has moved outwards and although relatively stable at this time, remedial action is warranted to prevent further displacement and ultimately failure.

The wall has clearly been in this state for a number of years and we consider there are two options available at this time.

Option 1

The bulging brickwork should be strengthened by tying the outer leaf back to the inner leaf with modern stainless steel remedial wall ties at 600mm centres horizontally and 300mm vertically – in a staggered pattern. This is closer than normal but the distortions are excessive and thus additional restraint is required.

The wall should be further restrained by strapping back to the ground, first and second floors by exposing the outer three joists where running parallel or the end 600mm of each joist where running into the wall. Galvanised steel straps can then be bolted to the wall and screwed down to the timbers with solid timber noggins between beneath each strap position. Straps should be at 1.0m centres where joists run parallel.

We also recommend further strapping between the internal cross walls and gable wall using similar galvanised steel straps at 600mm vertical centres up the walls.

This strengthening work should be sufficient to restrain the wall in its current deformed state but will not remove the visible distortions.

Option 2

If a more robust solution is required to remove the distortions then the only solution is to take down the wall and rebuild plumb.

We consider that the wall is built with two separate leaves of brickwork. This should mean that only the outer leaf needs to be carefully removed and a new skin of brickwork (either new bricks to match or existing bricks cleaned off and re-used) built up off the existing course at ground level to roof level.

The new leaf will need to be tied into the inner leaf with suitable stainless steel 'frame ties' screwed and plugged to the inner leaf in a similar pattern as Option 1.

Strengthening of the wall is still required in the form of strapping back to the internal structure as described in Option 1.

The new brickwork should be bonded into the existing brickwork to the front and rear returns by toothing into each for strength.

This option resolves the issue of deformation but obviously has greater cost.

In addition to the above remedial action, repairs in the form of crack stitching and reinforcing the masonry joints over the rear doors to tie the gable into the main rear elevation should be carried out.

7. Conclusions.

The property is a left hand side semi detached house built approx. 100 years ago of traditional masonry construction.

We have been instructed to look at the distortions apparent to the gable wall.

We are satisfied that there is no evidence of any vertical settlement movement to the gable wall, however lateral displacement is taking place and needs to be restrained before worsening and failing.

We recommend that the wall is strengthened in its current distorted state by tying together and strapping to the internal structure or the outer leaf taken down and rebuilt plumb. Both options require strapping to the internal structure for stability.

The latter option results in an undistorted wall surface, which will be more suitable for re-sale in the future but is a more costly option. Tying the wall together is much less expensive, but although can be guaranteed as stable, could deter prospective purchasers at re-sale.

We trust that this is all sufficient for your purposes, however, should you have any queries then please do not hesitate to contact us.

Yours sincerely



Jonathan Hayes

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For [STL Projects Ltd](#)