STRUCTURES
MADE EASY LTD

Consulting Structural Engineers and Surveyors

Structural Engineer's Sample Report

Client	Ref: 123457
For	

www.structures-made-easy.co.uk

STRUCTURES
MADE EASY LTD

Location xxx

Structures Made Easy Limited

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Principal: xxx
Consultant: xxx.

1. INSTRUCTIONS

I confirm your instructions to carry out a survey of the structural condition of the property known as:-

xxxx

I confirm that this report, its contents and recommendations therein may be used by the building society or bank for mortgage purposes.

2. SCOPE OF THE REPORT

This report is produced as a result of a visual non-disruptive inspection of the above premises.

I have not inspected the woodwork, or any other inaccessible parts of the structure, which are covered, or unexposed, and I am therefore unable to confirm that these parts of the building are free from defects.

The engineer acknowledges the co-operation of the vendors in allowing access to the property, at the agreed time and their assistance in the clarification of points raised during on-site discussions.

3. CLIENT DETAILS

Name and address of client:	Mr xxx xxxx xxxx xxxx xxxx
Name of purchaser:	Mr xxxx
Address of property inspected:	#2 & #4 xxxxx
Reference:	xxxx
Date of Inspection:	xxxx
Weather:	Overcast, Cool and Heavy Rain
Tenure:	Freehold (to be confirmed by the solicitor/ conveyancer)
Agents dealing with property:	Mr. xxxx xxxx xxxx xxxx London Tel: E-mail:

4. INTRODUCTION

Following a valuation survey, on behalf of the bank / building society, who were proposing to provide the necessary mortgage to purchase the property, on behalf of a prospective purchaser, concern was raised over the following points:-

a] possible structural movement having taken place.

Verbal instructions were received, via the estate agents, to carry out a survey of the property, and report on the findings.

5. GENERAL DESCRIPTION

The property is a one bedroomed, ground floor flat, which is half of a converted end-of-terraced house, built approx 120 years ago.

The property is constructed as follows:

Main walls:	9” thick solid masonry
Internal Walls:	4” thick brick solid masonry / timber stud partitions with a plaster finish / plasterboard cladding both sides
Roof:	Traditional pitched slopes, clad with concrete tiles
Floors:	Concrete at ground floor level, and timber joists and softwood boarding at ground & first floor level.

6. THE SURVEY

The property is a one bedroomed dwelling, which is representative of the type of flat conversion commonly found in the Inner London region.

These houses are of conventional 1900's construction, consisting of solid masonry walls, with a two storey back addition to the rear. The property appears to have had an additional extension constructed at the time of the conversion..

The roof is a standard duo-pitch design clad with interlocking concrete tiles. The original roof covering was Welsh slates which have been replaced with new interlocking concrete tiles.

The first floor flat appears to have had a habitable room formed in the roof. A UPVC lean-to style of conservatory has been formed by building the glazed panels and roof of the existing original 9" thick stock boundary wall.

The main drainage to the building runs out into a shallow manhole at the rear of property. Here the foul waste connects into a common foul sewer as does the rainwater, which as is common in this local authority.

The engineer inspected the exterior of the property first of all and noted the following salient points:-

MAIN FRONT ELEVATION:

1] The chimney stacks to the flank wall of the main terrace were noted to be showing a tendency to lean slightly.
2] a mature tree has been cut down in the last 12 months. It is understood that the remainder of the trunk has been treated to gradually kill of the roots.

MAIN FLANK ELEVATION:

3] The engineer noted that there were indications of a slight bow in the flank wall of the terrace, at approx the same level as the floor joists.
4] a loose brick was noted to the section of the flank wall that forms part of the first floor flat.
5] stepped cracking was also noted to the same part of the flank wall, close to the rear gutter area.

MAIN REAR ELEVATION (Back Addition):

5] The engineer noted that there was a very large crack on the party wall line that was up to 25mm wide. This is behind the cast iron rainwater down-pipe.

6] the engineer also noted poor quality pointing to the panel of brickwork between the utility room window (to the ground floor flat) and the window above it.

7] Vertical cracking was also noted to the right hand side of the same window, starting at the old cast in-situ concrete lintel, going down to the end of the cill.

8] your attention is drawn to the manner of the drain installation to the newly refurbished main bathroom. This needs to be taken up and re-paid in accordance with the requirements of Approved Document H.

9] there is the remains of a substantially pollarded evergreen tree with ivy growing up it. This is situated approx 3m from the corner of the back addition.

10] there is also a medium sized shrub, on the boundary with no 4 and the rear boundary wall. This again is quite close to the building.

FLANK ELEVATION (Back Addition):

11] The engineer noted cracking, commencing at the left hand end of the kitchen/dining room window cill, going downwards towards ground level. There are two cracks in this panel of brickwork.

12] poor quality pointing was noted to the left of the taller sash window.

Your attention is drawn to two other points which affect the first floor flat and not the ground floor flat:-

a] cracking to the chimney stack serving the breasts to the back additions of nos 2 & 4.

b] cracking to the parapet wall, to the rear of the in-line stacks.

Access was allowed, by the owner's son, to the rear of no 4. Access was not afforded to the interior of the back addition.

There is cracking visible, from the top right hand corner of the door nearest the junction of the rear and flank walls of the back addition, going up towards the eaves of the roof. This crack is circa 6mm wide, minimum. Another crack goes from the right hand end of the brick arch of the same door, up to the right hand

end of the window cill, directly above it. The pointing around these cracks was in very poor condition. Stepped cracking was also noted through the brick arch over the ground floor level window.

The engineer inspected the **interior** of the property next and noted the following salient points:-

KITCHEN/DINING ROOM:

13] the ceilings and floors were noted to be sloping gradually towards the corner of the rear and flank walls of the back addition.

RECEPTION ROOM/BEDROOM:

14] the engineer noted slight distortion to the door frames.

15] the floors were also noted to be apparently, sloping away from the horizontal.

BATHROOM/UTILTY ROOM:

16] the engineer noted that the floor level had been raised by adding 100 x 50 joists over the existing floor. It appears as though the work is not quite finished!

7. SUMMARY

Having inspected the site, and considered the information currently available the engineer has formed the following conclusions:-

The engineer is of the opinion that the cracking, both externally and internally, is representative of the movement that previously occurred, where it would appear that not only has no 4 has moved away from no 2, reflecting the direction in which the building settled, but that the back addition to no 2 has moved away in a similar manner, al be it to a lesser extent.

What has caused this movement?

The engineer is of the opinion that the drains to no 4 have failed, thus causing the corner of the back addition to settle over many many years. This has resulted in the dramatic cracking witnessed along the party wall line, especially to the chimney stack and the parapet wall. The condition of no 4 suggests that the owner is not aware of this structural problem, nor has the property been maintained very well.

No 2 is felt to have settled to a much lesser extent, due to the effects of the tree roots on the corner of the back addition. One can see, from the size of the tree trunk, that this tree was much taller and larger than is currently visible.

One also has the situation whereby the boundary wall, upon which the UPVC lean-to has been built, is leaning over. This wall was never meant to be a structural wall.

It is obviously a common known fact that all Victorian period buildings are built on brick spread footings, which are generally shallow, and do not have conventional concrete foundations, like more modern dwellings.

A few are found to have a clinker base below the spread footings, but this varies in quality from good to poor, since the consistency of the clinker always varies.

Because of both this, and the fact that Victorian period buildings are built with a weak lime based mortar, they are normally found to be susceptible to any form of shrinkage or swelling or the upper clay strata, due to the extremities of the climate.

The bottom line is that all old houses like this will suffer some minor movement, over their lives; it cannot be avoided.

You should be aware that houses in this vicinity are built off highly shrinkable clay which is susceptible to shrinkage or heave due to the excess moisture being taken away from the ground by trees of other vegetation. Where the fine roots grow through the clay, it desiccates as the soil dries out.

Dry summers, like 1996/97 as well as low rainfall make the problem worse. The clay never receives enough rainfall to allow it to swell up again and it gradually shrinks. if one experiences a period of sudden continuous rainfall, then the clay will gradually swell again. This results in any cracks closing up slightly. This process continues over a yearly cycle with the clay shrinking and swelling.

The external cracking requires repairing using the Helifix system, and making good the pointing; where the crack is very large, as per the one to the party wall, some localized stitching will be required. The issue is that the problem is not confined to the ground floor flat, but the first floor flat and no 4.

The drain runs to no 4 need to be renewed as soon as possible otherwise, the corner of the back addition to no 4 will carry on moving.

Removing the tree in the garden of no 2 will allow the ground to gradually recover, especially as the roots begin to die off. Similarly, ensuring the remainder of the tree trunk in the front garden is injected with a suitable root killer will allow a gradual recovery of the ground to the front of the building.

The other smaller problems to the top of the flank to the terrace are affecting the 1st floor flat and they must be suffering some form of damp problems. This strikes the engineer as a matter of poor workmanship, when the loft conversion works were carried out, plus long term issues with the wall itself.

The building, as a whole, needs some remedial works to be carried out, so the two flat owners @ no 2 plus the owner of no 4 must work together so that the costs can be spread correctly across the three freeholders who must take responsibility for the existing problems.

8. CONCLUSION

It would appear that movement to no 2 seems to be historic, now remedial measures are being taken with regard to the trees. However, the problems afflicting no 4 will continue to worsen. The cracking to the main back addition rear wall and the flank wall to no 2, at ground floor level, can be repaired now. It is

critical that the walls are repaired in a manner which will limit any further cracking at these apparent weak points in the walls.

9. RECOMMENDATIONS

As a result of the survey carried out, the following works are recommended to be carried out:-

1] Remove the old cast iron downpipe to the rear back addition wall, and install a series of Heli-fix stainless steel reinforcing bars across the bed joints, using the specified epoxy grout.

Bond good quality stock bricks across the crack, if required. Re-point once the work is completed

A provisional sum of £3,500 plus VAT @ 20% should be allowed for to cover the cost of these works.

2] Similarly repair the cracking to the flank wall, at ground floor level. This latter repair system is approved by insurance companies for this type of repair.

A provisional sum of £1,000 plus VAT @ 20% should be allowed for to cover the cost of these works.

3] re-point all defective brickwork relative to the ground floor flat.

A provisional sum of £600 plus VAT @ 20% should be allowed for to cover the cost of these works.

4] remove the main tree in the rear garden, grind down the stump and inject with a suitable chemical to destroy the roots.

A provisional sum of £1,500 plus VAT @ 20% should be allowed for to cover the cost of these works.

5] excavate the grey pvc drain from the main bathroom, and re-lay it in pea-shingle so that it has at least 150mm of pea-shingle and 75mm of concrete over it. Install a new bend into the manhole, ensuring a fall of at least 1:40 from the bathroom to the manhole.

A provisional sum of £750 plus VAT @ 20% should be allowed for to cover the cost of these works.

Advise:

The owners of the first floor flat and no 4 must be alerted to the issues that are affecting the building and be actively encouraged to take ownership of the problems affecting the two properties.