

Report on Structural Inspection

at

**23b Cranbrook Park
Wood Green**

**Job No. 21-113
March 2021**

EXECUTIVE SUMMARY

This report covers an Engineer's inspection of a property for the purpose of identifying and assessing structural defects.

It concludes that the property is in generally sound structural condition but with a number of defects capable of being repaired. Chief of these is the flimsy roof structure, which is currently serviceable but will need to be reinforced or replaced before long.

Authorised by:

Charles Tallack



Charles Tallack B.Eng(Hons), C.Eng, MIMechE, ACGI

**Structural Engineers Cambridge Limited
The White Horse
London Road, Pampisford
Cambridge CB22 3EF**

23b Cranbrook Park
Wood Green
London

N22 5NA

Page 2 of 10

March 2021

INTRODUCTION

At the request of Specialist Xpress on behalf of Joe Hornsby and James Cousins, I visited the above address on 4th March 2021 in order to inspect and comment on the structural integrity of the building.



The layout and situation of the property is described in the accompanying plan. A visual examination of the exterior was made from ground level at the front only, and the interior was viewed on the upper storey. The roof structure was inspected from the loft space. The ground floor flat and the exterior at the rear were not accessible for inspection.

No concealed parts of the building were opened up for inspection at this time. Unless specifically described in this report, no elements concealed from view or inaccessible for inspection can be considered free from defect or decay.

This report does not constitute a full building survey and specifically excludes the following:

- a) The decorative condition of the property
- b) The condition of the property with respect to dampness, dry rot, timber infestation and the like, unless structurally relevant
- c) The condition of services
- d) The condition of the roof, floor, wall and ceiling coverings
- e) The location of the property, its value and other aspects such as searches, boundaries etc.

No monitoring, long term investigation, testing of materials of construction or calculations have been carried out at this stage.

This report is prepared solely for the named client and their professional advisers and no liability is extended to any other person who may seek to rely on it.

23b Cranbrook Park
Wood Green
London

N22 5NA

Page 3 of 10

March 2021

OBSERVATIONS

The property in question is a first floor flat in a terraced house estimated to date from the late 19th Century. This is presumed to have been converted from a two-storey dwelling at some time in the late C.20th.

A Building Survey report was prepared by David Holdom FRICS from an inspection on 9th February 2021. This report refers to comments made therein but seeks not to duplicate its findings except where structurally relevant.

The leaseholder's attention is drawn to the surveyor's comments with regard to the upkeep and repair of the common parts of the building, which can be apportioned to the freehold owner(s) and the leasehold tenants in different ways.

This is particularly relevant with regard to the roof structure and so the prospective purchaser is encouraged to seek legal advice with regard to the terms of the lease before committing to purchase.

The original house is of typical construction for its age, with solid brick external walls under a pitched roof clad with synthetic slate tiles.

The front elevation features a two-storey bay with a felt-covered flat roof projecting below the eaves of the roof.

Regarding the roof coverings, it is quite likely that the artificial slates will have been manufactured before asbestos-containing materials were banned in 1999.

The roof coverings were in a fair condition, and the abutments with the parapets of the party walls were sealed with lead flashings. The existing tiles will be expected to last long enough to serve until the roof structure is upgraded.

The pots had been relatively recently fitted with ventilated cowls, although prior to this the flues had been open, allowing rainwater to drain down the chimneys into the loft.



23b Cranbrook Park
Wood Green
London

N22 5NA

Page 4 of 10

March 2021

The chimney breasts against the party wall had been removed from the bedrooms and the rooms below, and the flues supported in the loft space. The support arrangement for each comprised pairs of steel brackets bolted to the party wall, on which the brickwork was pinned up on a steel plate resting across the brackets.



The buckets and bowls placed beneath the chimney were presumably intended to catch the rainwater, but would have overflowed onto the ceiling as soon as they were full.

The plastic pipe leads from the extractor fan to the chimney, but was not connected. The fan would not be powerful enough to overcome the draught of the chimney, and so this arrangement would be useless in any case.



There were also signs of leakage down the face of the chimney from the back-gutter up-slope from the stack; however it is possible that this may have been repaired at the time the chimney cowls were fitted.



The strength of the chimney support depends on the security of the anchor bolts in the party wall, which is governed by the strength of the brickwork.

The anchors are too closely-spaced in a vertical direction to resist the pull-out force exerted by the offset weight of the chimney, and so would not meet the design criteria for the anchorage. Fortunately, the chimneys remained bonded to the party wall and so had not exerted their full weight onto the support brackets.



The roof structure is a traditional site-cut timber carcase with softwood rafters coupled at eaves level by the ceiling joists and supported by purlins braced with struts.

The size of the rafters and purlins was completely inadequate for the size of the roof and it is fortunate that the replacement tiles were not heavier concrete as used on the next-door property.



23b Cranbrook Park
Wood Green
London

N22 5NA

Page 5 of 10

March 2021

The loft relies on the internal loadbearing wall for support as well as the outside walls. This had been modified during the conversion to flats to allow a kitchen to be inserted between the front and rear rooms, separated by studwork partitions.

The newer post supported on timber members spanning across the kitchen was presumably an attempt to reinforce the roof by supporting the ridge board at the apex of the rafters.

The purlins are supported on the chimneys at one end instead of on the party wall. The brick corbels projecting from the wall are a means of ensuring fire separation between the adjoining properties to comply with contemporaneous London Building Regulations.

The weight imparted to the chimney supports by the purlins will add to the force on the masonry anchors, but this is a relatively small proportion of the mass of the chimney.

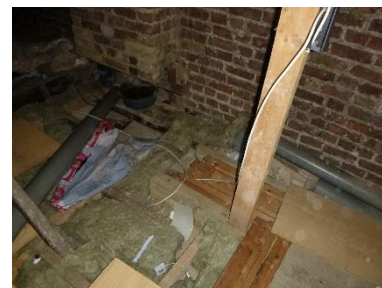
The capacity of the ceiling joists to support the weight of items stored in the loft is very limited, and so nothing should be stored there, to avoid damage to the ceilings.

As the ceiling joists are only $\frac{5}{8}$ of the usual size, the ceilings should be treated as even more flimsy than normal. The beams referred to in the Building Survey are actually the original ceiling binders, but again are undersized.

The chimney breast in the rear wing had also been removed from the bedroom. This part of the roof was inaccessible as there was no hatch, and so the presence of a chimney support could not be verified.

The rear roof could not be inspected either, but by opening the bedroom window (which binds against the gutter), the profile of the roof could be seen to dip between the kitchen and the gable wall at the back.

Such distortion would not be unusual but hints at weakness in the roof structure similar to that identified in the main roof.



The roof might be expected to have a residual service life not exceeding ten years before major repairs or replacement will be necessary.

In the case of constructing a loft conversion, most of the inherent flaws in the roof structure and the chimney supports can be addressed in the process of design. However, it will be necessary to verify the responsibility for upkeep of the roof structure with regard to freehold ownership before commencing construction, and Party Wall Agreements will also need to be secured with the adjoining owners.

The design of the loft conversion would need to deal with the following issues:

- i. The internal walls flanking the kitchen cannot be used as supporting walls, as they do not align with the position of the original spine wall remaining on the storey below.
- ii. The rafters will not bear the weight of additional insulation and ceilings, and will most likely need to be replaced.
- iii. The ceiling joists (even if the normal size) would not support the imposed load on a domestic floor, and so would normally be augmented by timber joists laid parallel. The ceiling joists will need to be suspended from this new floor platform to allow the binders to be removed.
- iv. The attic floor platform will need to be supported on steel beams spanning between the party walls, since the internal walls cannot be counted on to provide support.
- v. The chimneys can then be securely pinned up on steel beams running parallel to the party wall and supported on the main beams, rendering the existing brackets superfluous.
- vi. All of the above work would require Building Control approval, as well as Party Wall agreements and the consent of the freehold owner(s). Planning permission may not be needed if the conversion complies with the rules for Permitted Development.
- vii. The extra depth of the floor and insulation at rafter level will reduce the headroom from the current 2.3 metres at the apex of the roof to around 2.0 metres, which is just adequate. The only statutory requirement for headroom is over the staircase, which can be eased to 1.9m above the centreline of the stair, in the case of an attic room.
- viii. In order to provide a safe means of escape in what would become a three-storey building, all doors leading from habitable rooms onto the stairwell and hallway to the exit door will need to be of fire-resisting construction (FD20 minimum standard).

23b Cranbrook Park
Wood Green
London

N22 5NA

Page 7 of 10

March 2021

As the exterior of the building could not be inspected, it was not possible to assess whether the building had experienced structural movement or subsidence, except from the interior.

There were no obvious signs of recent or active movement, and cracking was confined to a hairline-width separation crack between the party wall and the ceiling of the front room, which is most likely to reflect the flimsiness of the ceiling.

The pediments over the entrance doors of the adjoining properties were slightly distorted, but this is likely to be the result of historic settlement and is judged as not being active or progressive.

The internal walls were of modern timber studwork, replacing the brick spine wall. Shadow lines on the plasterboard are a sign of condensation or moisture damage, which was probably the result of water leaking down the chimney flues.

This will dry out over time with proper ventilation but if the problem persists it will be necessary to strip off and replace the plasterboard before redecorating.

The laminate flooring was in fair condition but the joints had opened up into the front bay, and there was a gap between the floor and the skirting board at the back wall.

The first floor joists are, since the conversion, required to bear the additional load of the partition walls and the loft transferred from above, which will increase the deflection of the joists leading to a sag in the floor.

This would increase only gradually, as the response of timber is related to the duration of the applied load as well as its moisture content, and so no dramatic changes would be expected.

However, the loadbearing capacity of the floor will have been somewhat reduced, and heavy items of furniture such as wardrobes will need to be carefully placed to avoid overloading the floor.



CONCLUSIONS

The property is in a superficially stable condition, with no significant evidence of structural instability or recent or active foundation movement.

The classification of the damage on the Building Research Establishment's scale is no worse than 1 (fine), where the crack width does not exceed 1mm.

As the exterior of the property was not accessible for inspection, no judgement on the stability of the foundations or likelihood of further movement could be made. Based on the observations from this single inspection, it is logically impossible to assert that movement of the foundations will not occur in future; however this is considered to be unlikely provided routine repairs and maintenance are not neglected.

The construction of the roof is more than usually flimsy, although appears to be watertight and serviceable for the time being. Barring extreme weather events and overloading of the loft with stored items, the roof may be expected to have a few years' residual life before requiring a major overhaul or conversion to attic accommodation.

The chimney supports would not meet the standard required for Building Control approval as the design capacity of the masonry anchors in the party wall is insufficient to bear the full weight of the chimneys. However, the stacks appear to be reasonably stable for the time being and currently show no signs of deterioration or incipient collapse.

RECOMMENDATIONS

Whilst the design of a loft conversion would address the principal defects in the property, insurance cover in the interim may not be simple to obtain. If a loft conversion cannot be completed within the next few (say 5) years, then an interim step may be to design and install the support steelwork, which would allow the roof and the chimneys to be better supported, giving them a useful extension to their service life. Such work may cost in the region of £6,000 but would be recouped on completion of the conversion.

Structural alterations such as the creation of openings in loadbearing walls, or the addition of an extension or loft conversion will change the pattern of loading on the walls and foundations, and should not be undertaken without consideration of the risk of structural damage. An engineer's guidance should be sought in this event and an application for Building Regulations approval will also be necessary in most cases.

Charles Tallack B.Eng (Hons), C.Eng, MStructE, MIMechE, ACGI

References and Notes:

- [1] British Geological Survey
[2] Extract from Buildings Research Establishment website

BRE Digest 251: Assessment of damage in low-rise buildings^[2]

Six categories of crack are identified, which linked the width and number of cracks to the type of repair that was appropriate.

Damage categories with descriptions of typical damage. Ease of repair in italics.

0 - Hairline cracks of less than about 0.1 mm which are classed as *negligible*. No action required.

1 - Fine cracks that can be treated easily using normal decoration. Damage generally restricted to internal wall finishes; cracks rarely visible in external brickwork. Typical crack widths up to 1 mm.

2 - *Cracks easily filled*. Recurrent cracks can be masked by suitable linings. Cracks not necessarily visible externally; some external repointing may be required to ensure weather-tightness. Doors and windows may stick slightly and require easing and adjusting. Typical crack widths up to 5 mm.

3 - *Cracks that require some opening up and can be patched by a mason*. Repointing of external brickwork and possibly a small amount of brickwork to be replaced. 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 requires breaking-out and replacing sections of walls*, 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 that requires a major repair job, involving partial or complete rebuilding*. 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.

In general, categories 0, 1 and 2 with crack widths up to 5 mm can be regarded as 'aesthetic' issues that require only redecoration. Categories 3 and 4 can generally be regarded as 'serviceability' issues, that is, they affect the weathertightness of the building and the operation of doors and windows.

Category 5 presents 'stability' issues and is likely to require structural intervention.

BRE Digest 251, and in particular the table above, is now used widely in the industry as a way of categorising cracks and determining whether any intervention is necessary.

It should be stressed that these comments are a simplification of the assessment needed to properly classify damage to housing. Several factors, including whether the widths of the cracks are increasing with time, can affect the classification. BRE Digest 251 should be consulted when carrying out any assessment and a building professional should be consulted where damage is significant.

23b Cranbrook Park
Wood Green
London

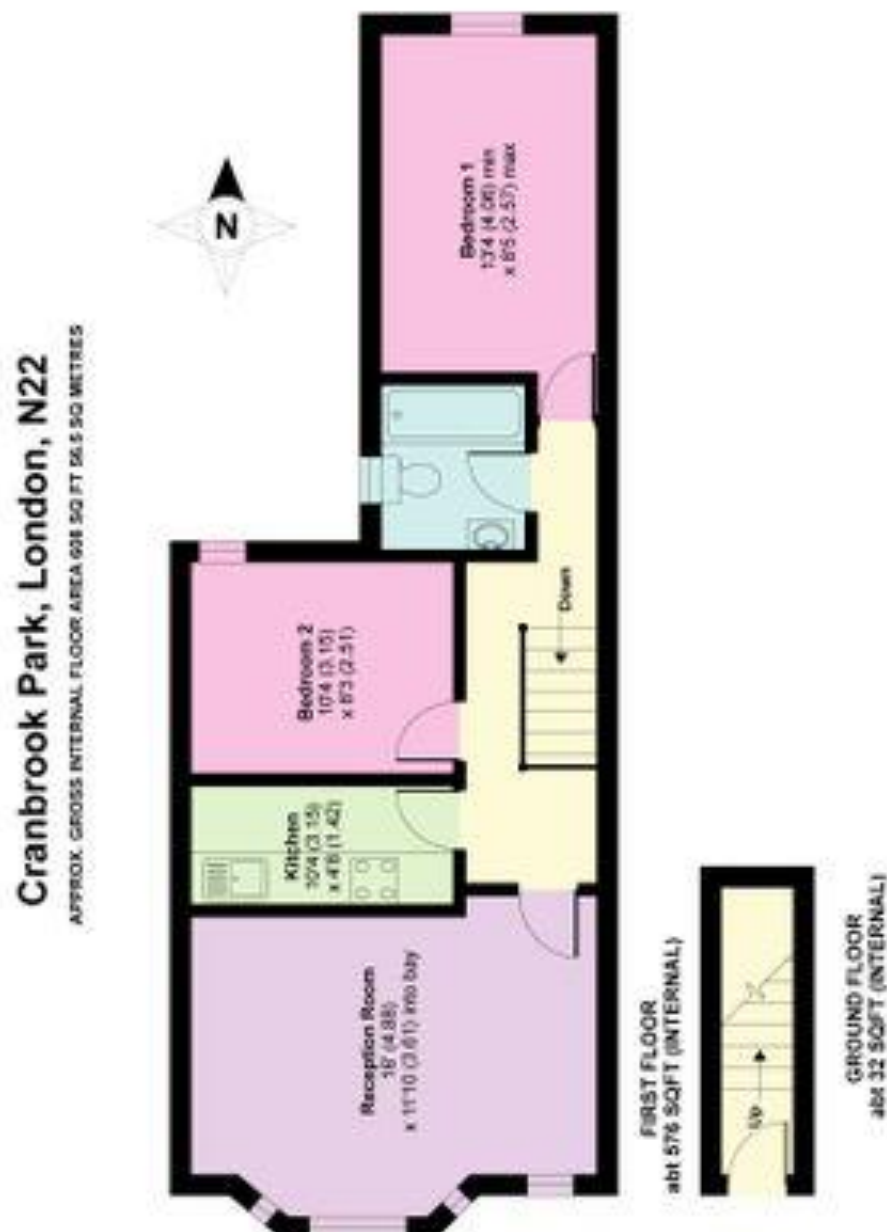
N22 5NA

Page 10 of 10

March 2021

Appendix – Floor Plans

Source: Zoopla (see also measured plans by SECL, attached separately)



Whilst every effort has been made to ensure the accuracy of the floor plan contained here, measurements of doors, windows and rooms are approximate and no responsibility is taken for any error, omission or misstatement. These plans are for information purposes only as defined by RICS Code of Measuring Practice and should be used as such by any prospective purchaser. Specificity in particular is given in the total square footage of this property. It should be noted that this figure is given on the basis of a best estimate of the actual area of the property.