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Title - Survey Of 22 High Street

Site Address – 22 High Street
Brigstock
Kettering
NN14 3HA

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Contents

1.0 – Report Basis

This report has been prepared on instruction given by Mr K Pearce on Tuesday 8th March 2022.

This report is based on a survey carried out on Thursday 17th March 2022. The survey was limited to a visual inspection and site measurements using a spirit level as no opening up of the construction was carried out.

This report provides an indication of the cause of structural damage to No. 22 High Street only. This report will also comment on the extent of structural alterations possible to the existing structure during proposed refurbishment works.

Recommendations have been made on likely remedial work and further investigation work that may be required.

2.0 – Property Description

The building is a two-storey semi-detached property with a small rear single storey annex forming the Kitchen. The property was formely part of one larger dwelling that was sub-divided to form No.'s 20 and 22 High Street. Photograph No.'s 1 to 3, contained in Appendix A, show the front and rear elevations.

The property is bounded to the rear north-east elevation by Back Lane, to the front south-west elevation by High Street, to the north-west and south-east elevations by adjacent dwellings. Immediately to the rear of the of the dwelling is garden space.

At ground floor level is the front door with direct access from the pavement to the Lounge on the left-hand side of the property. Photograph No.'s 4 and 5, contained in Appendix A, show the Lounge layout. A door opening in the right-hand Lounge wall, near to the rear wall of the property, leads through to a short corridor accessing the ground floor Bedroom to the right-hand side of the property. Doors off this corridor lead into an under-stair cupboard and a staircase leading up to first floor. Photograph No. 8, contained in Appendix A, shows this corridor. The floor level steps up into the corridor then slopes down in to the Bedroom. The ground floor Bedroom has a large walk-in fireplace to the Lounge dividing wall as shown in Photograph No. 9, contained in Appendix A. Photograph No. 10 shows the dividing wall between the Bedroom and rear stairwell and WC. The door to the stairwell is to the left and the WC to the right-hand side of this wall. The Kitchen is a single storey annex extending out toward the garden across the width of the Lounge as shown in Photograph No.'s 6 and 7 in Appendix A.

The stairwell is centrally positioned at the rear of the property. There are two bedrooms at first floor level, one to the right-hand side and the other to the front left-hand side of the property. A Bathroom is present at the rear left-hand corner of the property. Photograph No.'s 11 and 12 show the right-hand bedroom, No.'s 13 and 14 the left-hand Bedroom and No.'s 15 and 16 the rear Bathroom.

The duo-pitched main roof spans from front to rear over the main part of the building. The main roof is covered with slates. The roof is formed from rafters spanning from the ridge down to the front and rear eaves walls with a purlin at approx. mid-height. The purlins are supported by the gable and party wall and span on to an 'A' shape timber frame on the line of the dividing wall between the stairwell and Bathroom at first floor level. Alterations have been carried out to the roof construction above the stairwell upper landing in that there appears to be a former water tank platform timber support structure just above the level of the present ceiling.

The ground floor construction appears to be a thin concrete slab covered with floor tiles. The first floor is of timber construction and appears to span between the left-hand gable wall and Lounge/Bedroom dividing wall to the left-hand side of the property. This floor is also supported near mid-span by a timber beam that spans between the original front and rear walls of the property. The floor over the ground floor

right-hand Bedroom spans from front to rear with a support beam, spanning between the corridor wall and right-hand party wall, near mid-span.

The front and rear eaves walls are of stone construction between 650mm and 780mm in thickness. The left-hand gable wall was originally 450mm thick and formed part of a dividing wall with the neighbouring building. The gable wall was faced with 170mm of stone work when the neighbouring site was re-developed. The internal wall between the Lounge and ground floor Bedroom is of masonry constructions at ground and first floor levels becoming narrower overall by approx. 150mm at first floor level. Internal walls at first floor level are of timber stud construction.

The foul water drainage appears to run to a sewer at the rear of the property. The surface water for the front and rear roof slopes are collected by shared rainwater downpipes. It is not known if the surface water drainage runs to a surface water drain or soakaways.

From available geological information, the underlying sub-soil appears to be a bedrock of Limestone although and outcrop of Alluvium, a Clay, Silt, Sand and Gravel mix, is likely to the west of the property.

The present owners are planning to construct a two-storey extension to the rear of the property with alterations to the internal layout. The proposed layout is shown on the diagram contained in Appendix B.

3.0 – Structural Damage

3.1 – Damage Location

External damage location and crack direction is recorded when looking at the relevant elevation. Internal damage location within a room is based on its position relative to the front of the dwelling. The direction of an internal crack is recorded when looking at the wall elevation internally.

Reference should also be made to the floor plan contained in Appendix B.

3.2 – External Damage

3.2.1 – Front Elevation

See Photograph No.'s 1 and 2, contained in Appendix A, for a general view of the front elevation.

(1) Minor hairline cracking is present in some bed and perpend joints above the top left-hand side of the Lounge window opening. Some mortar from one joint area has spalled.

(2) Minor horizontal hairline cracking is present in the wall panel to the left-hand side of the first floor front left-hand Bedroom window at cill level.

(3) Minor hairline cracking is present in some bed and perpend joints above the top right-hand corner of the front door opening.

(4) Some repointing has been carried out to a bed joint above the ground floor right-hand Bedroom window opening but no cracks have re-appeared.

(5) The roof slopes either side of the dividing wall between the Bedrooms appears to dip slightly. The ridge line also dips slightly over the same areas.

3.2.2 – Rear Elevation

See Photograph No. 3, contained in Appendix A, for a general view of the rear elevation.

(1) No discernable crack damage appears to be present to the rear elevation.

(2) The roof slope above the rear Bathroom appears to dip slightly.

3.3 – Internal Damage

3.3.1 - Ground Floor – Lounge

(a) The left-hand gable wall was found to lean out by approx. 15mm adjacent to the front left-hand corner.

(b) The dividing wall between the Lounge and Bedroom was found to lean toward the bedroom by approx. 15mm over the lower half of the wall and approx. 30mm to the upper half.

(c) The pier between the front entrance door and the adjacent window in the front wall was found to lean out by approx. 30mm.

(d) The ground floor slab was found to be level.

(e) Staining was found to be present to the left-hand gable wall. This staining is considered to have been residual from a leak in the first floor hot water cylinder. The surface finish of the wall has bubbled up and minor cracking is visible beneath. There are surface indentations in the plaster beneath.

(f) Minor hairline cracking is visible at the junction of the wall and ceiling around the rear left-hand corner of the Lounge.

(g) A minor hairline crack is visible around the left-hand bearing of the lintel over the Lounge/Kitchen door opening.

3.3.2 – Ground Floor - Bedroom

(a) The front wall, between the window and right-hand party wall leans out by approx. 10mm.

(b) The ground floor slab was found to be level.

(c) The surface of the side wall to corridor from the Lounge and the right-hand side wall supporting the Bressummer beam to the fireplace alcove have either had the surface finish removed, with some mechanical damage to the plaster, or the finish has debonded over time.

(d) Minor cracking is present at the junction of the wall and ceiling above the left-hand side of the front wall window opening.

(e) Staining, or discolouration, is present to the surfaces of the walls at various locations.

3.3.3 – Ground Floor – Kitchen

(a) As the Kitchen annex will be demolished as part of the refurbishment/extension work, no note has been taken of structural movement to this area.

3.3.4 – First Floor – Right-Hand Side Bedroom

(a) The dividing wall/chimney construction to the left-hand side of the Bedroom was found to lean toward the adjacent Bedroom by approx. 5mm over the lower half of the wall and approx. 30mm to the upper half.

(b) The rear wall, between the window and rear left-hand corner was found to lean in to the room over the upper half by approx. 15mm.

(c) The right hand party wall, approx. half-way along its length, was found to lean in by approx. 15mm over the upper half.

(d) The timber first floor construction was found to be level.

(e) A 1mm wide vertical crack is present at the junction of the masonry above the front wall window and the left-hand reveal.

(f) A vertical crack, up to 1mm in width, is present in the right-hand party wall toward the front of the property adjacent to the ceiling mounted pull switch.

(g) A vertical hairline crack is present in the same right-hand party wall toward the rear of the property.

(h) A hairline crack extends vertically up from the top left-hand corner of the rear wall window opening to the ceiling.

(i) Vertical cracks are present above the door opening through to the landing. The plaster/render to one of the cracks has broken away.

(j) There are numerous hairline cracks in the ceiling and these appear to be a plasterboard joints.

3.3.5 – First Floor – Front Left-Hand Side Bedroom

(a) The front wall, between the window and right-hand Bedroom dividing wall/chimney, was found to be vertical over the lower half but lean in to the room over the upper half by approx. 15mm.

(b) The front wall, between the window and left-hand gable wall, was found to lean out by approx. 10mm over the lower half and vertical to the top half.

(c) The timber floor construction was found to slope down from the left-hand gable wall and the right-hand Bedroom/Chimney dividing wall toward the centre of the room.

(d) Hairline 'crazing' type cracking is present to the plaster of the right-hand dividing wall between the left and right-hand Bedrooms.

(e) A vertical crack, up to 1mm in width, is present at the front right-hand corner of the room at the junction formed by the right-hand dividing wall and front wall.

(f) A diagonal hairline crack extends from the crack noted in Item (e) above from approx. mid-height of the wall toward the top left-hand corner of the front wall window opening.

(g) A hairline crack extends up around the left-hand side of the front wall window opening to the ceiling.

(h) A vertical crack, up to 1mm in width, extends up from the top right-hand corner of the front wall window opening to ceiling level. This crack then extends across the ceiling to the Bathroom dividing wall.

(i) Two hairline near vertical cracks are present in the left-hand gable wall.

(j) Vertical cracking, up to 2mm in width, is present to the junction of the left-hand gable wall and the Bathroom dividing stud wall.

(k) A vertical crack, up to 1mm in width, is present in the timber studwork above the door opening to the rear Bathroom.

(l) A crack, approx. 1mm in width, is present in the ceiling, similar to the one noted in Item (h) above, in line with the top left-hand corner of the front wall window opening.

3.3.6 – First Floor – Rear Left-Hand Side Bathroom

(a) A vertical crack, up to 1mm in width, is present at the rear left-hand corner of the Bathroom. This crack extends across the ceiling, parallel with the left-hand gable wall, toward the front Bedroom dividing wall.

(b) A vertical hairline crack is present in the front Bedroom dividing timber stud wall adjacent to the gable wall.

(c) The floor construction was found to slope down from the left-hand gable wall toward the centre of the Bathroom and from the rear wall down toward the front Bedroom dividing wall.

3.3.7 – First Floor – Landing

(a) No major crack damage was present to the walls surrounding the landing area.

4.0 – Conclusions

4.1 – Source Of Damage To Structure

There can be several causes for damage to a structure, however, a number can be ruled out based on the crack patterns present within the building structure.

Cracks formed in masonry walls through subsidence are generally stepped diagonal ones extending away from the corners of openings. These cracks would normally be combined with a sloping floor, a lean in a wall or reveal of a window/door opening. Whilst a diagonal crack was noted at first floor level to the left-hand Bedroom, the ground floor was found to be level and no other indications of subsidence exist within this property

The cracks formed through thermal movement are generally vertical. Thermal movement can be caused by external heating and cooling due to the natural 24 hour weather cycle. Thermal movement can also be caused internally within a building due a change in the heating temperature affecting materials that have different expansion or contraction characteristics.

Properties of this age were built to be more flexible and move naturally compared to modern buildings where the materials used are more rigid.

4.2 – Thermal Movement – External Causes

All materials expand and contract according to the change in their temperature. Expansion joints are provided in modern masonry walls to ensure any movement is controlled and limited to the location of the joint. In older properties, thermal movement tends to cause vertical cracks to appear as observed in the first floor Bedrooms.

4.3 – Thermal Movement – Dissimilar Materials

Materials expand and contract at different rates. This is particularly true of timber and blockwork/masonry walls. The shrinking and swelling of these materials can cause cracking at the junctions of a timber stud and masonry walls. The same pattern of cracking can occur at the junction of a ceiling and wall as the ceiling finishes are fixed to a timber structure. This appears to be the case in this dwelling.

4.4 – Settlement And Deflection

All materials naturally compress as they are loaded. This happens to a structure as it is built. Minor cracking can appear at different points in the structure as a result.

Timber beams will also deflect over time and whilst modern construction is designed to limit deflection, older properties were not. This is the case here with the floor over the Lounge. The floor support beam has deflected, hence the slope in the floor above in the front Bedroom and rear Bathroom.

The same is also true for the roof construction. The front and rear roof slopes, plus the ridge, have deflected. As the roof structure has moved, cracking has been induced to the ceiling below.

Movement in the roof construction can induce movement in the walls it is supported by. This is evident by some minor bowing of the wall construction. It should be pointed out that whilst modern wall construction is built to tight tolerances, older properties were not built to the same standard. Unevenness in wall construction should be expected.

5.0 – Recommendations

1 - Mortar joints to the external elevations should be regularly checked and repointed as necessary.

2 - The condition of the timber to the roof construction should be checked for rot or infestation by a specialist company and treated accordingly. If the timber condition is found to be poor then strengthening the roof structurally should be considered.

3 - Damp to ground floor walls appears to be a problem and may be caused by either a lack of or breakdown in the damp-proof course. Older properties relied on the wall thickness to keep out damp and nor were they heated/ventilated/insulated to reduce the effects of condensation. It would be recommended that a damp specialist company check the walls and a damp-proof course (DPC) inserted or injected if necessary.

4 - Internal cracks should be repaired as part of normal decoration.

6.0 – Proposed Construction Work

6.1 – Alterations To Roof Construction

It is proposed to open up the roof area to form vaulted or cathedral type ceilings above the first floor bedrooms.

It is unlikely that the existing structure will be able to carry the additional loads from the sloping ceiling and insulation. The roof could be strengthened by installing additional rafters and potentially steel plates to the purlins.

6.2 – Alterations To The First Floor Landing Area

The wall facing the present staircase is an infill wall that may only be supporting the ceiling above the landing. The chimney construction appears to slope inward on the sides facing the front and rear walls. Toward the front wall, a small storage cupboard has been built in to this sloped area.

As long as the ceiling above the landing spans on to the original construction, the infill section could be removed to create additional space.

6.3 – Alterations To The Fireplace Within The Present Ground Floor Bedroom.

The bressummer beam is supporting the chimney construction at first floor level. This has been confirmed by measurements taken on site. There is an infill area above the fireplace between the bressummer beam and chimney breast at ground floor level that appears to be infill construction. This construction could be removed as long as it is not supporting the floor.

It should also be possible to remove the wall panels either side of the chimney breast by inserting lintels to support the wall above.

6.4 – Alterations To The Existing Ground Floor Slab

It would be recommended that the ground floor is insulated and provided with a damp-proof membrane (DPM) to improve the thermal performance of the floor and control damp.

The insulation and floor finish could be placed on top of the existing slab with a DPM between, however, this construction thickness would likely reduce the headroom by approx. 100mm if insulation and floorboards were used.

The floor could be re-laid with a new slab and insulation beneath with a DPM laid and linked to the damp-proofing in the external walls. This option would maintain the existing headroom, however, properties of this age had shallow foundations and the excavation for the floor slab could undermine the external walls.

The depth of the existing foundation can be proved by digging small trial holes within the property. The best option could then be determined.

Yours Faithfully

Mark Vaudeau C.Build.E FCABE

Appendix A – Photographs

Photograph No. 1 - Front Elevation Viewed From Outside No. 24 High Street
Photograph No. 2 - Front Elevation Viewed From Outside No. 20 High Street
Photograph No. 3 - Rear Elevation
Photograph No. 4 - Internal View From Lounge Front Wall Toward Kitchen Annex
Photograph No. 5 - Internal View From Kitchen Annex Toward Lounge Front Wall
Photograph No. 6 - Kitchen Annex Rear Wall
Photograph No. 7 - View On To Lounge/Kitchen Dividing Wall From Kitchen Annex
Photograph No. 8 - Corridor From Lounge To Ground Floor Right Hand Bedroom
Photograph No. 9 - View On To Fireplace Within Lounge/Bedroom Dividing Wall
Photograph No. 10 - View On To Ground Floor Right Hand Bedroom Rear Wall
Photograph No. 11 - View On To Front Wall Of First Floor Right Hand Bedroom
Photograph No. 12 - View On To Rear Wall Of First Floor Right Hand Bedroom
Photograph No. 13 - View On To Front Wall Of Front Bedroom
Photograph No. 14 - View On To Front Bedroom/Bathroom Dividing Wall
Photograph No. 15 - View On To Rear Bathroom Gable Wall
Photograph No. 16 - View On To Bathroom/Stairwell Dividing Wall

Photograph No. 1 – Front Elevation Viewed From Outside No. 24 High Street

Photograph No. 2 – Front Elevation Viewed From Outside No. 20 High Street

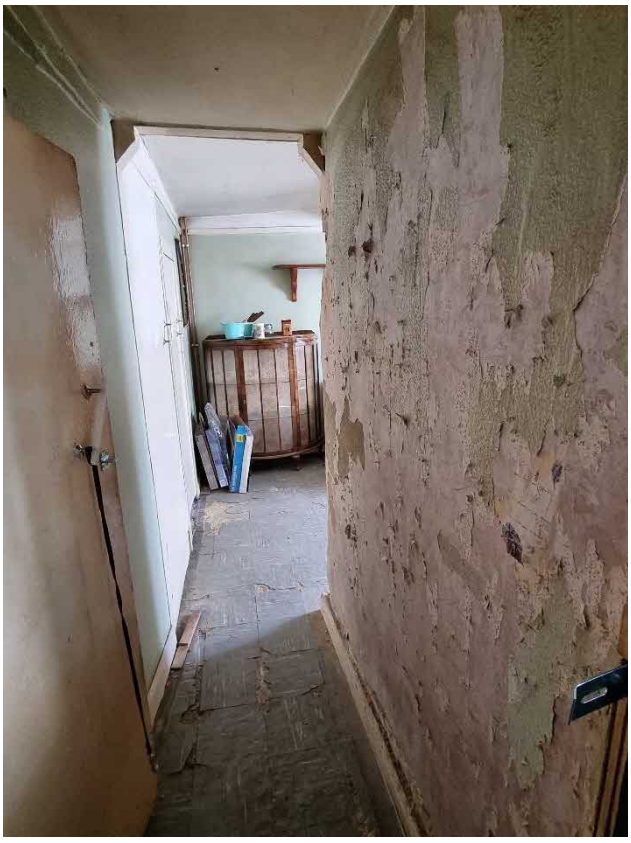
Photograph No. 3 – Rear Elevation

Photograph No. 4 – Internal View From Lounge Front Wall Toward Kitchen Annex

Photograph No. 5 – Internal View From Kitchen Annex Toward Lounge Front Wall

Photograph No. 6 – Kitchen Annex Rear Wall

Photograph No. 7 – View On To Lounge/Kitchen Dividing Wall From Kitchen Annex



Photograph No. 8 – Corridor From Lounge To Ground Floor Right Hand Bedroom

Photograph No. 9 – View On To Fireplace Within Lounge/Bedroom Dividing Wall

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Photograph No. 13 – View On To Front Wall Of Front Bedroom

Photograph No. 14 – View On To Front Bedroom/Bathroom Dividing Wall

Photograph No. 15 – View On To Rear Bathroom Gable Wall

Photograph No. 16 – View On To Bathroom/Stairwell Dividing Wall

Appendix B

Diagram No. 1 - Proposed Floor Plans

Diagram No. 1 – Proposed Floor Plans