IStructE ANDREWS NEWBY PARTNERSHIP

STRUCTURAL
& CIVIL
CONSULTING
ENGINEERS

FIRST STAGE APPRAISAL

86 WEST STREET
HAVANT
HAMPSHIRE
PO9 1LN

For

DAVID WILLETTS
and SARAH BUTTERFIELD
84 WEST STREET
HAVANT
HAMPSHIRE
PO9 1LN

HAVANT BOROUGH COUNCIL
24 MAR 2011
RECEIVED

By

ANDREWS NEWBY PARTNERSHIP
FORDER HOUSE
HIGH STREET
BURITON
NR. PETERSFIELD
HAMPSHIRE
GU31 5RX

Job No: 2844

Date: 6th August 2009

1.0 SYNOPSIS - (SEE ANP SKETCH 2844/SK/01-03 INCLUSIVE).

- ANP were instructed by Mr. D. Willetts on the 10th July 2009, to act as Structural Engineers to advise on the refurbishment works to 86 West Street, Havant.

  The proposal is to convert the existing single dwelling back to the original two dwellings and extend both to the rear.

- ANP advised the Clients that a two stage investigation would be appropriate given the condition of the building.

- The property is two storey, 3 bedroom terraced unit facing South onto West Street, Havant.

  Front and rear walls are in 225mm thick bonded brickwork and may have timber framing internally. Internal loadbearing walls are in 105 thick timber framing with infill brickwork.

  Roofs are clay tiled, pitched North/South to the front with 2 No. reverse pitches at the rear with hipped ends to the North.

- The First Stage Appraisal has revealed:-

Roof.

The front roof structure is in very poor condition and is considered to require replacement.

The 2 No. rear pitched roof spaces were not safely accessible.

The rear Northeast roof has been replaced above the ceiling joist level. Some distress is still evidenced in Bedroom 3 ceiling.

The rear Northwest roof is believed to be original, with some strengthening works included.

1.0 SYNOPSIS (Cont'd).

The junction with the front roof and this section is very suspect.

All roofs will require further examination following removal of the second floor ceilings.

First Floor.

The first floors, generally, span East/West from party walls over internal walls and beams.

Front Bedrooms 1 & 2 floors have been over-boarded almost certainly due to decay of the originally boarding.

There is considerable distortion in Bedroom 1 floor and a separation from the front wall to both Bedrooms 1 & 2 at this level.

Bedroom 3 shows a drop on centre against the stair wall and a general fall to the rear.

The over-boarding and distortion evidenced suggest the floor structure to be in poor condition.

The floor will be required to be stripped of ceilings for a more detailed examination.

Front (South) External Wall.

The front wall is not connected to the first floor and junctions with the internal loadbearing timber framed cross-walls and the party walls are all showing vertical separation.

Internally, the wall shows an outward lean at first floor level of approximately 100mm at the Study wall intersect and this lean is also evident in Bedrooms 1 & 2.

With no connection to cross-walls or first floor, the wall is restrained only by the dead bearing of the roof structure and consequently, its stability is questionable.

1.0 SYNOPSIS (Cont'd).

Temporary shoring will be required to this elevation as a priority, before further investigative works (at least to the front half of the building) are undertaken.

(See Section 8.0 Recommendations.)

Internal Walls and External/Party Wall Internal Faces.

The internal loadbearing walls are timber framed with brick infill.

There is evidence of insect infestation and decay in the framing and some distress in the walls.

Wall finishes will require to be removed from the walling in order to allow more detailed examination of the timber work and masonry.

Second Stage Appraisal.

Once the front elevation has been stabilized, all ceilings and internal wall finishes will be required to be removed.

The site should then be cleared of debris, including the remains of the Lounge ground floor timbers.

Engineer to define any trial pitting required for examination of the existing foundations.

Engineer to re-appraise the exposed structure.

Timber Preservation Specialist to examine all structural timbers and make recommendations for repair/strengthening/replacement/treatment etc.

Engineer to finalize Second Stage Appraisal with recommendations related to upgrade and conversion.

2.0 BRIEF.

2.1 Mr. D. Willetts instructed ANP at a meeting on the 10th July 2009, to act for himself and Sarah Butterfield to advise on the refurbishment works to No. 86 West Street, Havant.

ANP advised the Clients that an initial inspection indicated the building to be in extremely poor condition and would require a Structural Appraisal, probably in two stages.

2.2 The Clients wish to convert the existing single dwelling back to the original two terraced units and to add accommodation at the rear (North).

2.3 Plans and elevations of the existing building by Mike Gillings, Milton Road, Cowplain, were provided on the 6th July 2009, for assistance. (i.e., Drawing Nos. 1834/01, 02 & 03.)

3.0 DATE OF INSPECTIONS.

Initial Examination:- 3rd June 2009.

First Stage Inspection- 15th July 2009.

4.0 GENERAL DESCRIPTION.

Property consists of a two storey, three bedroom terraced unit facing Southwards directly onto West Street, Havant.

The front and rear elevations are in 215mm thick Flemish bonded brickwork and internal walls are, generally, timber framed with brick infill. The roof is tiled and pitched at approx 45° and spans North/South to the front, reversing to 2 No. East/West pitched roofs at the rear, both with hipped ends to the North and with a central valley gutter.

Earlier accommodation space is evident in the front Eastern half of the roof void.

First floors are timber, primarily spanning East/West (i.e., parallel to the front and rear elevations).

Ground floors are, generally, paved in flagstones, quarry tiles or concrete, except at the Lounge, where original timber joisting is still evident.

5.0 OBSERVATIONS.

5.1 ROOF - (See ANP Sketch No. 2844/SK/03).

5.1.1 *Front Southeast Accommodation Area.*

- Clay tiles on battens without felt.
- Tiling nails corroded.
- Lathe and plaster stripped from stud walls and ceiling.
- Random remains of ceiling joists at approx 1.75m height above floorboards.
- Large chimneystack at East on centre.
- Brickwork in poor condition. (**See Photo 001**.)
- East party wall appears to be formed in lathe and plaster on studwork. (Not accessible.) (**See Photo 002**.)
- Front rafters adjacent the chimneystack are resting against the brickwork without gaining a bearing.

  These rafters are in poor condition and have been "furred out" on their top surface when the roof was previously tiled, in an effort to remove some of the obvious deflection in the rafters.
- First 2 No. front rafters to West of stack are in extremely poor condition due to insect infestation and decay.

  They have also been "furred out" in the past. (**See Photo 003**.)

5.0 OBSERVATIONS (Cont'd).

- The third rafter from the stack houses a trimmer at approx mid pitch for what must have previously been a window opening over the following three rafter spaces (approx 900mm width).

  The main rafters framing the original opening are showing signs of decay.

  The opening has been infilled with 2 No. loose rafters, which are in poor condition. (**See Photo 003**.)

  The rafters from the front pitch do not align with those at the rear pitch, between the East stack and the incoming ridge from the rear roof.

  There is also an old ridge plate over the rafters at the rear pitch at this point (**see Photo 001**) and the rear rafters are bearing on it.

- West of the incoming rear ridge-board, the rafters to the front and rear pitch, are aligned and are probably tenoned into one another, since there is no ridge board. (**See Photo 008**.)

  Front pitch timbers West of the rear ridge beam appear in better condition, but have been previously "furred out" on their top face in order to remove some considerable deflection.

- The rear pitch rafters from the Eastern stack are, generally, lacking any triangulation with the front pitch.

  Few extend from the ridge to the loadbearing wall at floor level.

  Many are cut into the lay-board forming the rear valley. (**See Photos 004 & 005**.)

  Most sections are in average to poor condition and several have furrings on their top surface.

- The floor boarding appears to be in reasonable order and, what little can be seen of the floor joists, likewise. (Further examination is necessary.)

5.0 OBSERVATIONS (Cont'd).

5.1.2 *Rear Northeast Pitched Roof Space (i.e. To Rear of Accommodation Area).*

- The roof is pitched East/West with a hipped end to the North. (**See Photo 006.**)

  This roof has been totally replaced above ceiling joist level with softwood rafters over purlins at approx mid-pitch (see **Photo 006**).

  These purlins have been strutted diagonally down onto the centre of the ceiling to what is considered to be a large timber carriage beam spanning North/South.

  The original ceiling joists are not readily visible due to the volume of insulation, but are believed to span East/West. (**See Photo 007.**)

  NB:- The rafters are springing from a new timber plate bearing on the ceiling joists from the adjacent pitch to the West.

  The roof is therefore not tied/restrained at eaves level.

5.1.3 *Front Southwest Roof Space..*

- Tiles on battens without felt.
- Nailing corroded.
- Timbers in poor condition.
- Front pitch rafters spanning from eaves to ridge over a 75 x 100 purlin at mid-span.

  Considerable deflection (approx 150mm) has been made good by overlaying with 50 x 100 softwood rafters. (**See Photo 012.**)

- The front purlin is broken at mid-span and has been diagonally strutted, although there appears to be no loadbearing element below the strut.

- The rear pitch has 2 No. intermediate purlins, both of which are broken at mid-span. (**See Photos 014 & 017.**)

The rear pitch rafters are trimmed into the lower purlin and valley lay-board and are inadequately supported causing the purlin failure. (**See Photo 017.**)

5.0 OBSERVATIONS (Cont'd).

- The rear rafters have been "furred out" to compensate for the serious deflections evidenced. (**See Photo 017**.)

- The complete roof has been crudely and incorrectly strengthened in the past.

5.1.4 *Rear Northwest Roof Space*.

- Rear roof space not accessed.

- Roof pitch is East/West with hipped end at North.

- Tiles on battens without felt.

Roof appears to have mostly original timbers although 2 No. vertical diagonal struts have been added in the plane of the ridge.

Condition of timbers is anticipated as equivalent to those areas with original timbers already accessed, i.e., poor.

5.2 FIRST FLOOR - (SEE ANP SKETCH 2844/SK/02).

5.2.1 Bedroom 1.

- Front (South) wall bowing outwards on centre, particularly at the eaves.

- Front (South) wall separating approx 50mm from loadbearing timber framed partition to Bedroom 2. (**See Photos 018 & 019**.)

- Partition formed in timber frame with brick infill. (**See Photo 022**.)

- Head plate showing separation at South and considerable splitting and insect infestation. (**See Photo 021**.)

5.0 OBSERVATIONS (Cont'd).

- Diagonal brace exposed in wall would be expected to be housed into a vertical post at the South, but none evidenced. (**See Photo 019**.)

- At the Southwest corner, the timber framed party wall is fractured and showing a separation from the front (South) wall. (**See Photo 023**.)

- The first floor shows considerable distortion on centre. (**See Photo 018**.)

  The floor has been "over-boarded" East/West indicating the original North/South boarding to have decayed.

- There is a noticeable "hog" in the floor in line with the window East reveal, which can be expected to relate to a continuous bearing of the joists over the Study/corridor wall below.

- The first floor joists will span East/West parallel to the front wall. There is a noticeable separation between the floor and South elevation and without a bearing from the floor; the wall has no restraint at this level.

5.2.2 *Corridor*.

- The corridor/Bathroom partition is timber framed with brick infill and is expected to be supported on a beam over the Kitchen.

- The floor is over-boarded and there is evidence of decay in the lower boarding. (**See Photo 024**.)

- Originally, a stair from the ground floor passageway exited through this corridor at first floor, but has now been infilled. (**See Photo 025**.)

5.0 OBSERVATIONS (Cont'd).

5.2.3 *Bathroom.*

- 75mm Step up into Bathroom from corridor.
- First floor boarding running East/West and if not over-boarded, suggests floor joists span North/South.
- Timber framed loadbearing partition with Bedroom 3 at East, shows severely decayed head plate at Southeast corner. (**See Photo 026.**)

5.2.4 *Bedroom 2.*

- Outward lean in front elevation at eaves, but not as pronounced as at Bedroom 1.
- Separation at first floor with junction at front wall, becoming worse towards Bedroom 1.
- Vertical separation of Bedroom 1 / 2 partition to front wall.
- A vertical joint at brick pier in East party wall at junction with front wall. (**See Photo 027.**)
- Evidence of timber framing to party wall at East. (**See Photo 028.**)

  Considerable cracking evident in plasterwork.
- First floor over-boarded.

  Joists span East/West parallel to front elevation over single timber carriage beam fronting the Lounge fireplace. (**See ANP Sketch SK/02.**)

  Considered that post in Lounge at South bearing of carriage beam is an addition, (i.e., original beam extends into South wall over post) therefore beam bearing probably decayed and suspect.
- No restraint available from first floor to the front elevation.

5.0 OBSERVATIONS (Cont'd).

5.2.5 *Bedroom 3*.

- Internal loadbearing Bedroom 3 / Stair partition is timber framed with brick infill. The wall is very distorted on centre.

  The exposed timber framing is in poor condition.

  There is a drop in the floor at this point. (**See Photo 032**.)
  This may relate to decay in the carriage beam bearing below.

- First floor joists span East/West onto a centre carriage beam.

  There is a noticeable fall in the floor towards the rear (North) external wall.

- There is slight horizontal bow in the external rear (North) wall on centre.

- There is a pronounced bulge in the ceiling against the East party wall indicating failure of joisting over, or of the roof supports. (**See Photo 034**.)

5.3 GROUND FLOOR - (SEE ANP SKETCH 2844/SK/01).

5.3.1 *Lounge*.

- 130mm wide timber carriage beam fronting fireplace, spans front wall to Dining Room wall and projects below first floor by 120mm.

  Front 120mm x 125mm timber post is considered to have been added to support the beam end that has possibly decayed in the South wall at its bearing.

  The carriage beam bears onto a timber plate built into the brickwork at the window reveal.

5.0 OBSERVATIONS (Cont'd).

There are similar plates built into the reveal to secure the window lining.

A vertical fracture extends from the beam bearing plate down through the window reveal, approx 225mm from the lining.

There is a carriage beam and a pair of posts to the West, but these are all false.

- The South wall originally had a lathe and plaster finish on studwork, presumably to improve insulation.

- The ground floor has boarding on joisting directly onto the earth below and the majority has disintegrated from decay.

- A small trial hole was formed in the Southwest corner against the loadbearing partition to the passageway, to examine the foundations.

  The wall may have been constructed over a layer of chalk laid onto the coarse stony, natural ground.

  (A larger trial pit and more detailed examination is required.)

- The Southeast corner section of party wall is timber framed with brick infill.

- A passageway passes through No. 86 currently forming the hallway.

  This has a flagstone finish with a "dished" drain to the West and falls from the back to the front door, where there is a step up of approx 225mm to the outside pavement level.

- The Lounge/Hall loadbearing partition is timber framed with brick infill.

5.0 OBSERVATIONS (Cont'd).

5.3.2 *Study.*

- The Study/Hall partition is timber framed with brick infill.

  There is a 75mm wide vertical separation at the junction with the front (South) wall and this partition.

- There is a 30mm wide vertical separation at the junction at the West party wall and front elevation.

- The first floor is separating from the South wall.

- The South wall leans outwards approx 100mm from ground to first. (55mm in 1200mm measured by spirit level.)

- The ground floor slab has been replaced with a solid concrete slab.

  A timber beam extends across the rear of the Study from Lounge to West party wall, parallel to the front elevation.

5.3.3 *Kitchen.*

- The Southeast corner houses the remains of earlier staircase to first floor.

- Timber beam span across the Kitchen from a pier at the West party wall to the Hall wall.

  The beam shows evidence of insect infestation and decay.

- The timber lintel over the door frame to the Kitchen is distorted and decayed.

5.0 OBSERVATIONS (Cont'd).

5.3.4 Dining Room.

- The ground floor is flagstones and paviors.
- A central timber carriage beam over, spans North/South from stair to rear wall and supports the first floor.

- A timber plate is built into the Hall partition at the underside of the first floor joists.

6.0 DISCUSSION.

6.1 ROOF.

6.1.1 Front Southeast Accommodation Area.

The tiling will require to be removed to allow re-battening and felting, but primarily for structural works.

The front roof over the accommodation is structurally incorrect, has over-spanned rafters, valley boards etc., and has insect infestation and decay.

The extent of the structural defects, in our opinion, renders repairs/strengthening works unwarranted.

The second floor joists have not been examined due to limited access and may be suitable for retention.

These require examination from below by the removal of the bedroom and stair ceilings.

6.0 DISCUSSION (Cont'd).

6.1.2 Rear Northeast Pitched Roof Space.

This roof has been replaced in the past, but probably retains the original ceiling joists.

Access was not feasible.

Examination is required from below following the removal of Bedroom 3 ceiling.

6.1.3 Front Southwest Roof Space.

This roof is structurally inadequate and seriously distressed as a result.

Repairs/strengthening works are considered unwarranted.

6.1.4 Rear Northwest Roof Space (Access not Feasible).

Timbering at the junction with the front roof pitch is very suspect.

Examination is required following removal of the second floor ceilings over the Bathroom and corridor.

6.2 FIRST FLOOR.

6.2.1 Front Bedrooms 1 & 2.

The first floor boarding has decayed.

The floors are severely distorted.

The joists span parallel to the front elevation.

The cross-walls and party walls are separating from the front (South) elevation.

6.0 DISCUSSION (Cont'd).

There is no restraint to the front (South) wall offered by the first floor walls and consequently, the wall is virtually freestanding from ground floor to eaves level.

The front (South) wall is bowing and tending to lean outwards due to this lack of restraint.

Further examination of the structure walls, ceilings and floors is required, which will dictate the removal of all finishes.

However, the lack of restraint to the complete front wall will need to be addressed prior to these works.

6.2.2 Corridor, Bathroom and Bedroom 3.

Further examination of the structural walls, ceilings and floors is required, which will dictate the removal of all finishes.

6.3 GROUND FLOOR.

Further examination of the Lounge, Study and front Hallway requires the inclusion of stability bracing to the front South walls.

All structural walls and ceilings will require to be stripped of finishes to allow a more detailed examination.

The founding of the loadbearing walls requires further consideration and an appropriate trial pitting exercise should be included in a Second Stage Appraisal.

7.0 CONCLUSIONS.

7.1 FRONT (SOUTH) ELEVATION.

The examination has revealed a lack of restraint to the front elevation, which questions its overall stability.

- The first floors span East/West parallel to the front elevation, are in poor condition and are not connected to the front wall.

  Consequently, there is no horizontal restraint at first floor level.

- The ground and first floor internal loadbearing timber framed cross-walls and the party walls at the East and West are all showing a vertical separation at the junction with the front wall.

  Consequently, there is no vertical restraint afforded by the intersecting walls to the front wall over its full height.

- The roof structure to the front pitch is distressed and in very poor condition, but does offer a small degree of restraint at eaves level provided the connection of rafters to ceiling ties is adequate. (i.e., To contain the thrust from the roof rafters.)

Further investigation of this wall and complete structure of this building is required by the removal of finishes throughout.

However, the sensitive nature of the front (South) wall and the general poor quality of the remaining structure, dictates a need to **firstly, address the South wall stability**.

It will be necessary to introduce temporary shoring to the complete elevation within the highway. (West Street.)

7.0 CONCLUSIONS (Cont'd).

The shoring will require to be braced to ground level and consequently, will dictate a diversion of footpath and probably, local road narrowing to protect the temporary works from vehicles.

The front roof structure is in extremely poor condition and it is expected to require replacement in new works rather than repairs and strengthening.

Consideration should therefore be given to the form of the temporary works in West Street to provide an appropriate means to both fully restrain the front elevation and give adequate working access to the roof structure or even to support a temporary roof structure.

This latter possibility would depend upon the condition of the remainder of the structure and the need for continuous working under full weather protection.

Once the front elevation has been made safe:-

The ground and first floor ceilings should be removed throughout together with all plaster finishes to the walls.

This will enable a second stage examination of the timber roof members, first floor joists and beams, the timber framed walls and masonry.

A Timber Preservation Specialist will be required to examine and report on the condition/repair/replacement/treatment and in due course, provide a guarantee for any works undertaken to his specification.

Further examination of existing foundations will also be required.

8.0 RECOMMENDATIONS.

8.1 FRONT (SOUTH) ELEVATION.

Contractor to arrange for all temporary shoring works to front wall within the highway, permits etc., and give consideration to access for future superstructure works in the formation of such shoring.

It is possible to consider temporary shoring works within the building, but the consequent limitation to access within the site and the need to replace the front roof structure should also be addressed.

Once the front elevation has been stabilized:-

8.2 Contractor to carefully remove all ground and first floor ceilings together with all plaster wall finishes and clear away all debris.

This should include the removal of all the Lounge ground floor timbers.

8.3 Engineer to undertake Second Stage Structural Appraisal.

Timber Preservation Specialist will be required to examine and report on the condition of all timbers with regards to repair, strengthening, replacement, treatment, etc.

Engineer to define further trial pitting examination of foundations as necessary.

Engineer to provide Second Stage Structural Appraisal with the recommendations related to the upgrade and conversion.

Signed .....

H.J. NEWBY, C.Eng., F.I. Struct. E., F.F.B.



Photo 001 – Ridge at East Chimney Stack.



Photo 003 – Roof Accommodation Area Front Pitch.



Photo 004 – Roof Accommodation Area.
Rear Pitch Northeast Layboard/Beam.



Photo 005 – Roof Accommodation Rear Pitch.
Northeast Layboard.



Photo 006 – E-W Roof behind Roof Accommodation Area.



Photo 007 – Rear West Pitch behind Roof Accommodation Area.



Photo 008 – Ridge over Accommodation Area.
Showing Ridge Board from Rear Pitch.



Photo 009 – Roof Accommodation Area.
N.W. Corner Showing Stair Wall Panel and Rear Pitch.



Photo 010 – Roof Accommodation Area.
S.W. Corner, Front Pitch.

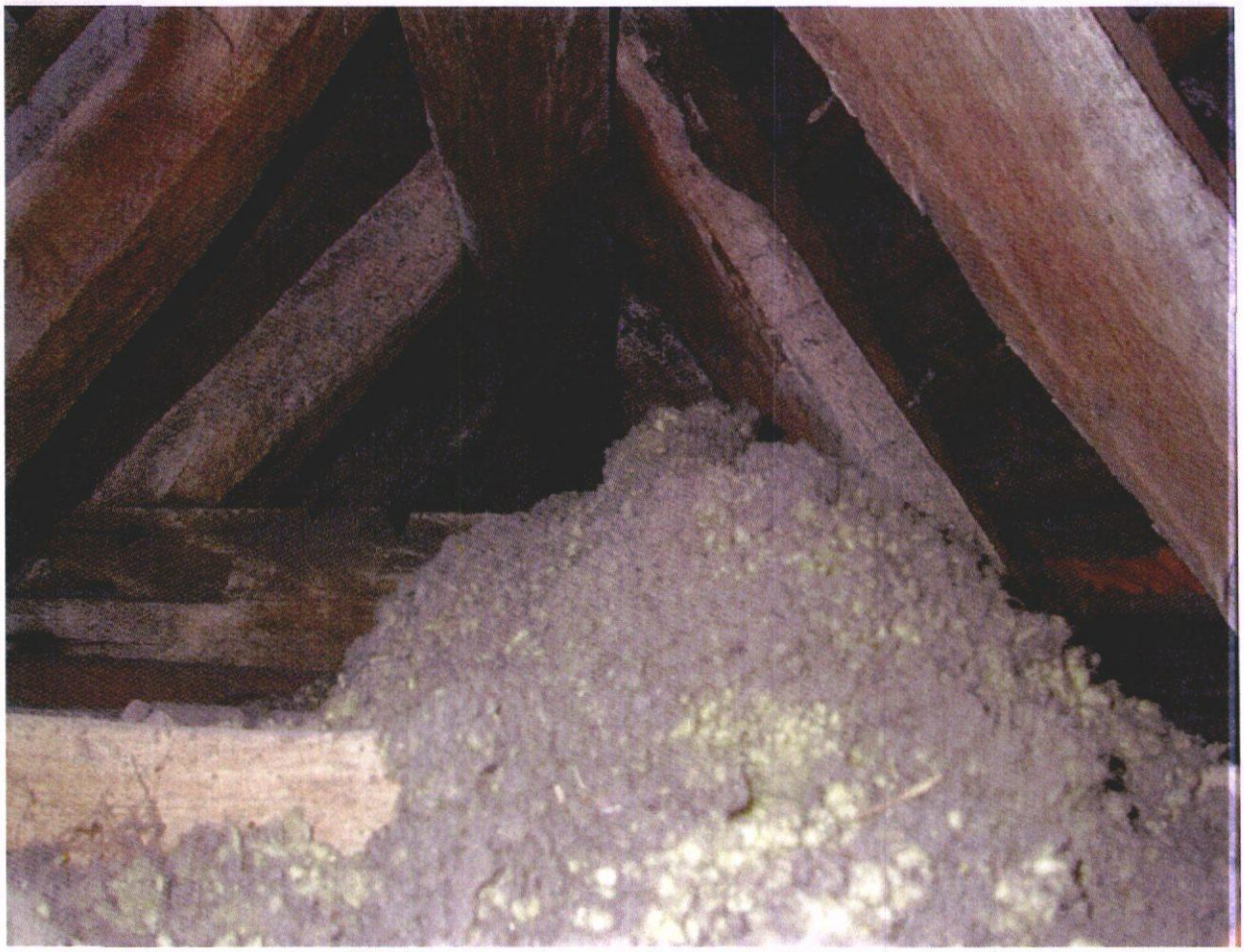


Photo 011 – Ridge Beam over S.W. Front Roof Space.



Photo 012 – S.W. Roof Space. Front Pitch. Broken Purlin at Strut Position.



Photo 013 – S.W. Roof Space. Rear Pitch Purlin Bearing at Party Wall.



Photo 014 – S.W. Roof Space. Rear Pitch. Broken Lower Purlin.



Photo 015 – N.W. Rear Roof Space.



Photo 016 – Front S.W. Roof Space. Ridge Beam Adjacent Stair.



Photo 017 – S.W. Roof Space. Rear Pitch. Broken Lower Purlin.

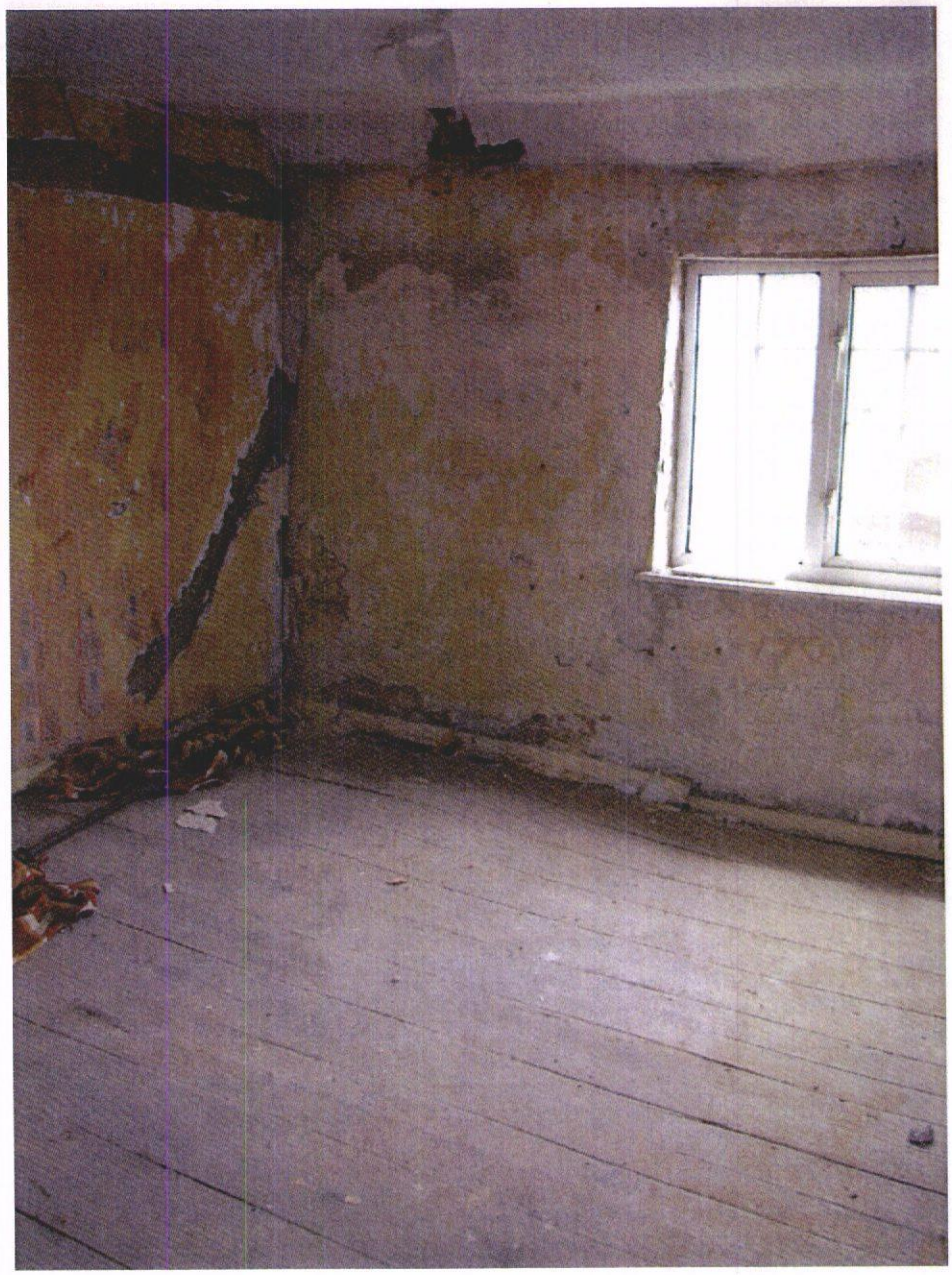


Photo 018 – Bedroom 1. S.E. Corner.

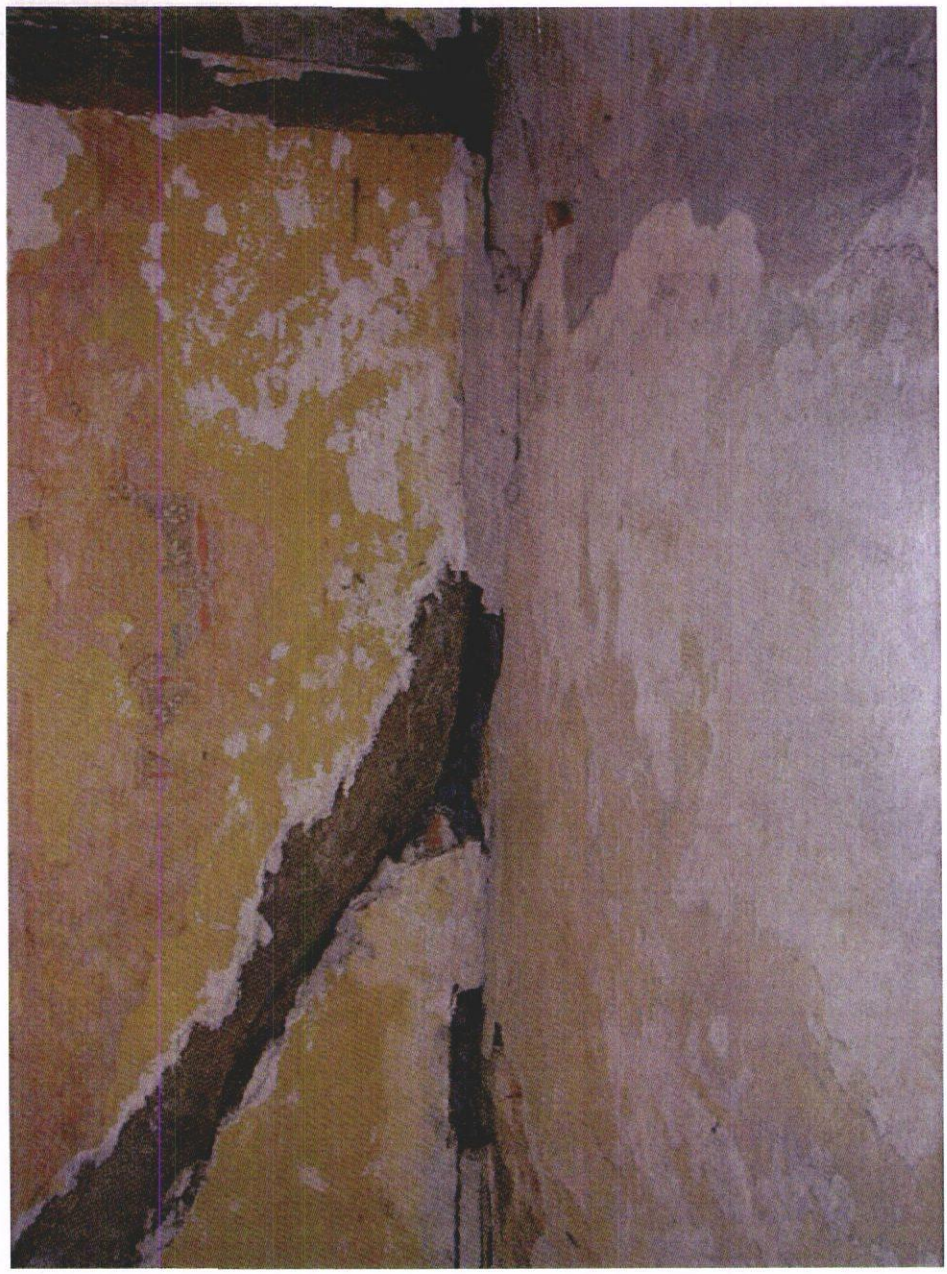


Photo 019 – Bedroom 1. S.E. Corner. Partition/South Wall Junction.



Photo 021 – Bedroom 1. S.E. Corner. Partition Junction with South Wall at Frame Head.

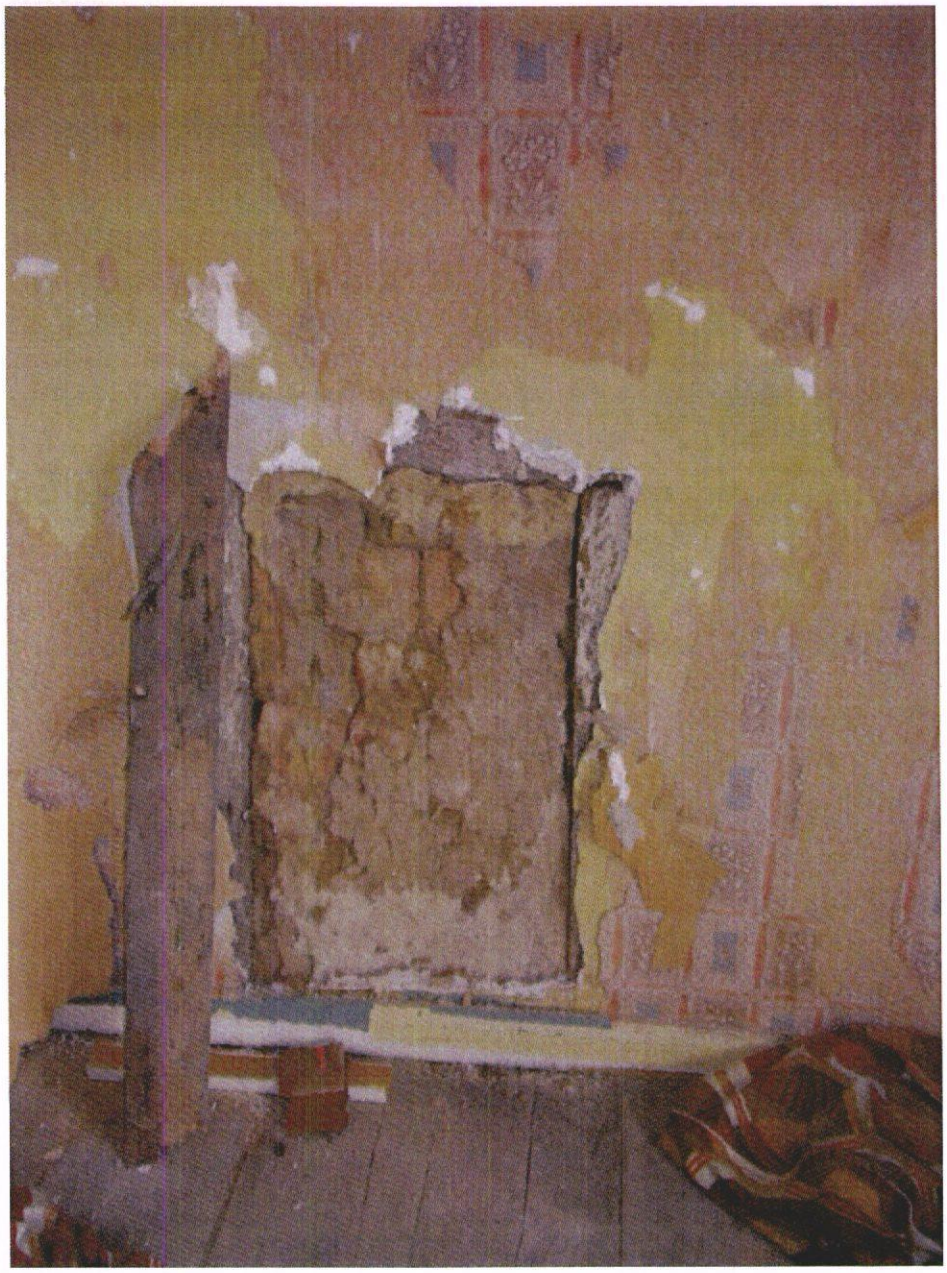


Photo 022 – N.E. Corner Adjacent Loft Stair. Showing Partition.



Photo 023 – Bedroom 1. S.W. Corner. Junction of Front Wall and West Party Wall.



Photo 024 – Corridor.
West Party Wall Junction with Loadbearing Timber Framed Bathroom Wall.



Photo 025 – Corridor.
West Party Wall/Bathroom Loadbearing Partition.



Photo 026 – Bathroom S.W. Corner.
Bedroom 3 Partition. Timber Frame Decay.

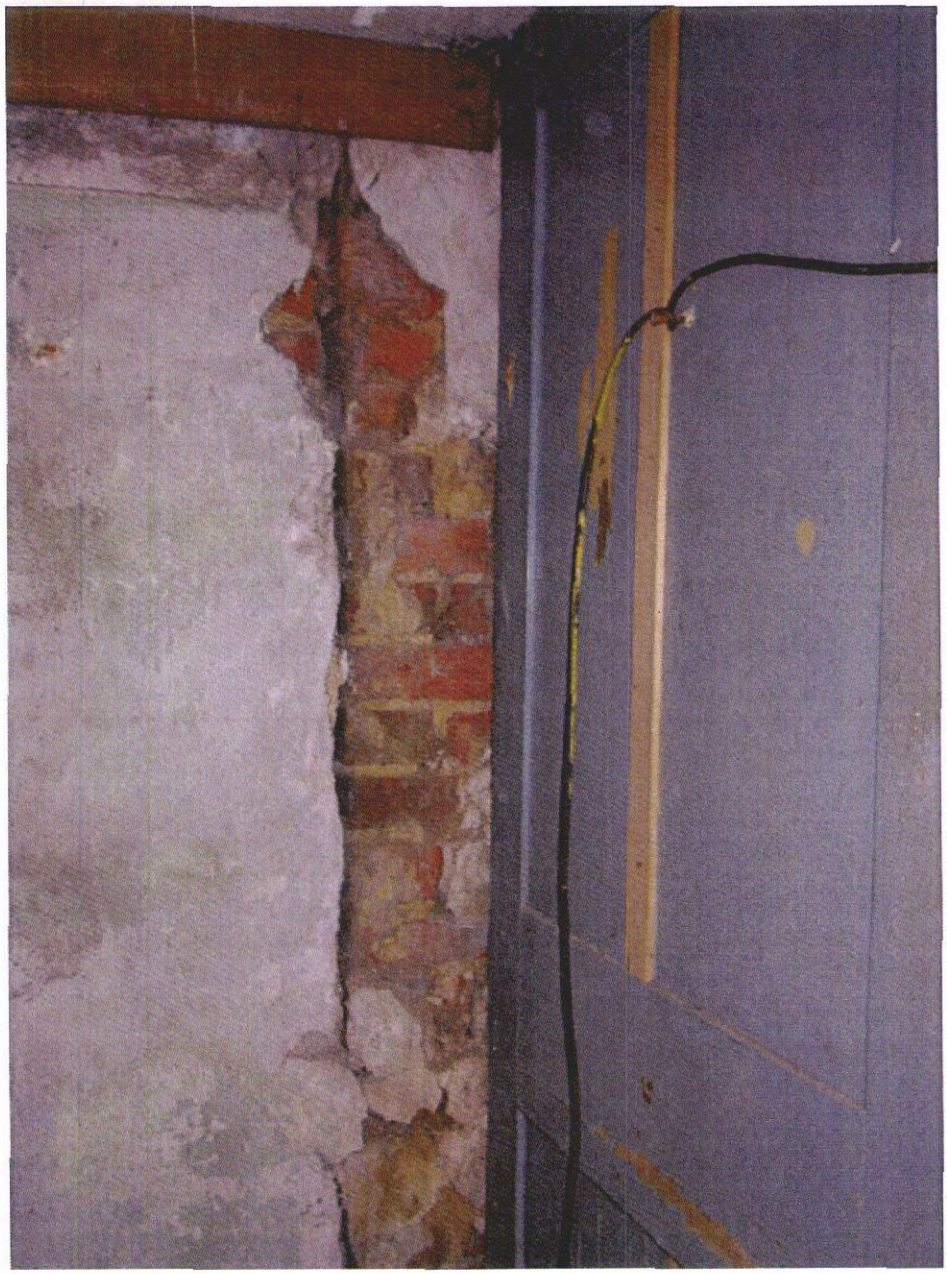


Photo 027 – Bedroom 2.
S.E. Corner. Party/Front Wall Junction.



Photo 028 – Bedroom 2. S.E. Corner. Showing East Party Wall.



Photo 031 – Bedroom 3. N.E. Corner.



Photo 032 – Bedroom 3. S.E. Corner. East Party Wall/Stair Wall Junction.



Photo 034 – Bedroom 3. N.E. Corner.



Photo 035 – North Elevation.
West Side. N.W. Hip/Party Wall to No. 88.



Photo 036 – North Elevation. East Side.
N.E. Hip Roof over Bedroom 3.



Photo 037 – North Elevation. N.E. Corner Stack.



Photo 039 – Lounge. S.E. Corner.
Trial Pit Through Timber Ground Floor.