

DEVISE.

42 Southwood Lane, N6 5EB

Response to queries from Conservation Officer

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Overview

Devise Structural Engineers were appointed by Chiara Fantini of Retrouvius Architectural Design to provide a response to the structural-based comments received from Elisabetta Tonazzi (Haringey Principal conservation officer) on 16th February 2023.

We were specifically asked to:

- Provide a structural assessment of the conditions of the roof and chimney prepared by a conservation engineer.
- Provide a condition survey of the decay conditions of the roof structure.
- Create a method statement for the remedial works to the front chimney stack.
- Indicate the extent and location of the proposed roof repairs on a structural drawing.

This document contains a structural assessment prepared by Edney Ndumbe (MEng MSc CEng MIStructE CARE Accredited Engineer), a timber condition survey prepared by Patrick Hughes MSc and a method statement and roof plan for the remedial works to the existing structure.



Figure 1: Birdseye View of building

Structural Assessment

42 Southwood Lane, London N6 5EB

Structural Inspection and Assessment 24th March 2023 - Notes

Introduction

This technical note has been prepared to summarise the findings of a structural inspection and assessment of the above property to look at the leaning chimney and the roof structure. The visit was undertaken on Friday 24th March 2023 by Edney Ndumbe, MEng MSc CEng MStructE CARE Accredited Engineer.

This note has been instructed by Devise Engineers, on behalf of the client.

This note is for the sole use of the Client only; it should not be used, or relied upon, by any third parties without express permission.

42 Southwood Lane, London N6 5EB is a four storey mid-terrace house built circa late 18th to early 19th century, located in Highgate, London N6. The property is Grade II listed and constructed with brown bricks rendered at the front and part rendered at the rear. The roof is a hipped common rafter construction with a central valley. The property is listed under the Planning (Listed Buildings and Conservation Areas) Act 1990 for its special architectural and historic interest. It was first listed in 1974.



Site Location Plan

Existing Building and Site



Front elevation



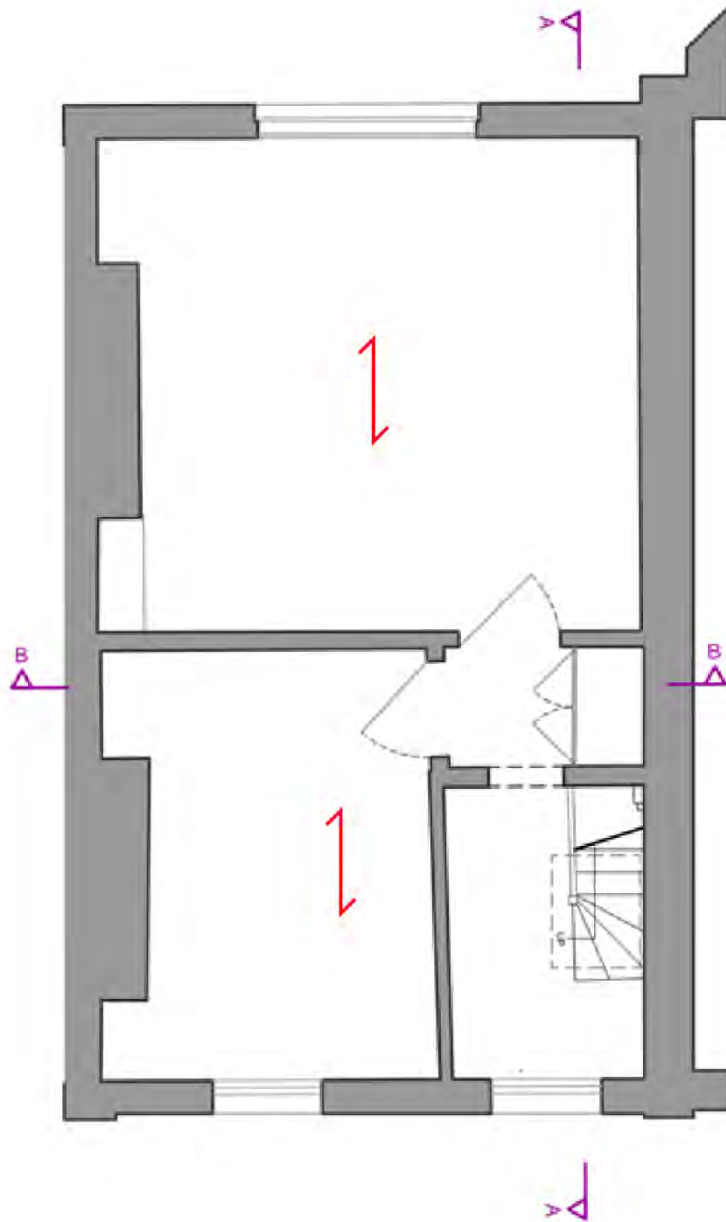
Front elevation

The existing building appears to be of traditional construction with loadbearing brickwork perimeter walls, internal timber studwork walls, timber floors and a timber roof supporting slates. The property was vacant at the time of visit and the finishes in some areas at roof level had been removed to expose the timber members. The inspection was limited to the leaning chimney (viewed from outside) and the roof structure.

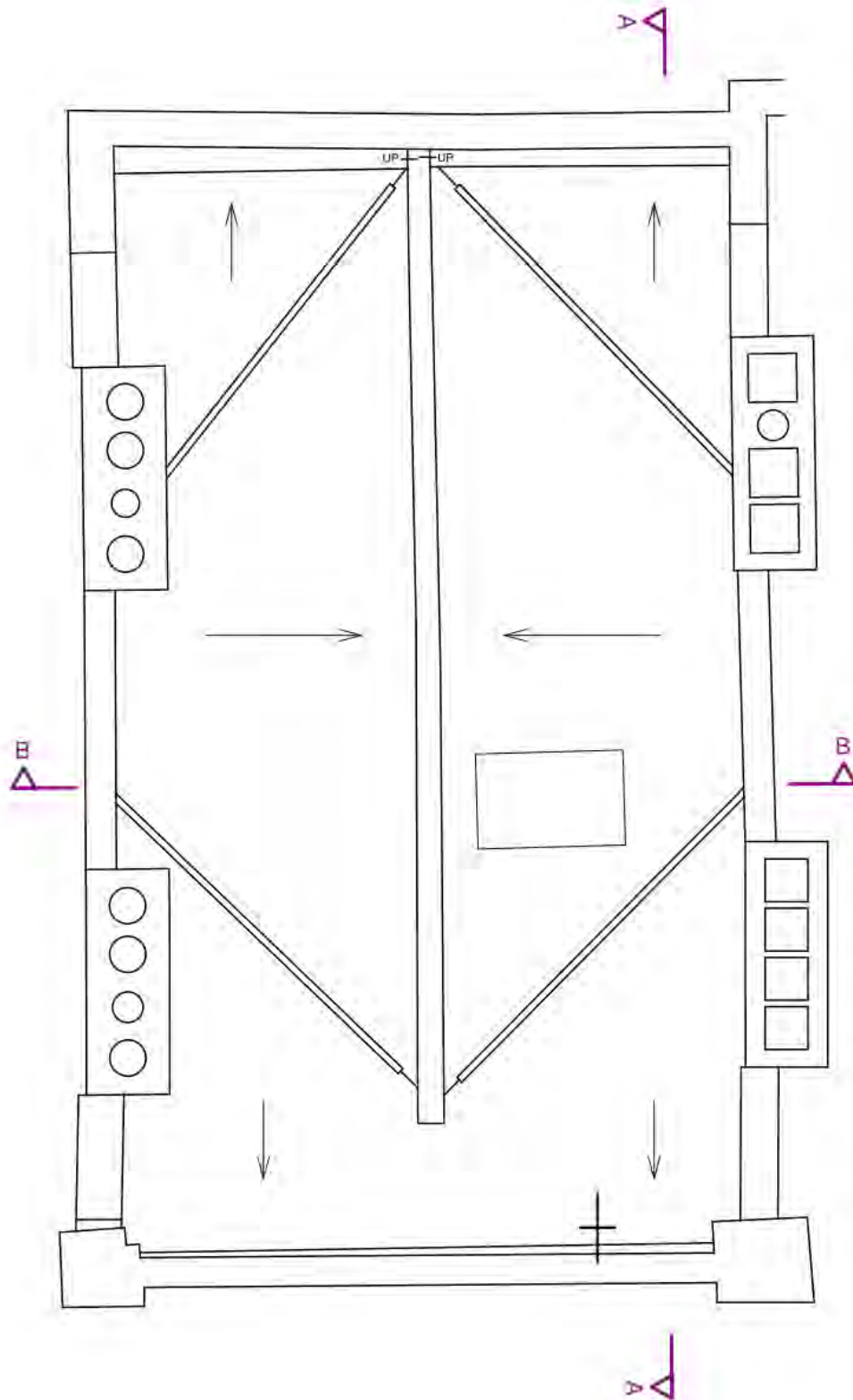
Ground Conditions:

Published geological records indicate that the site is likely underlain by made ground over yellowish brown silty clayey sand (Bagshot Formation) which in turn overlies the London Clay. The main wall foundations are expected to be founded in the sand.

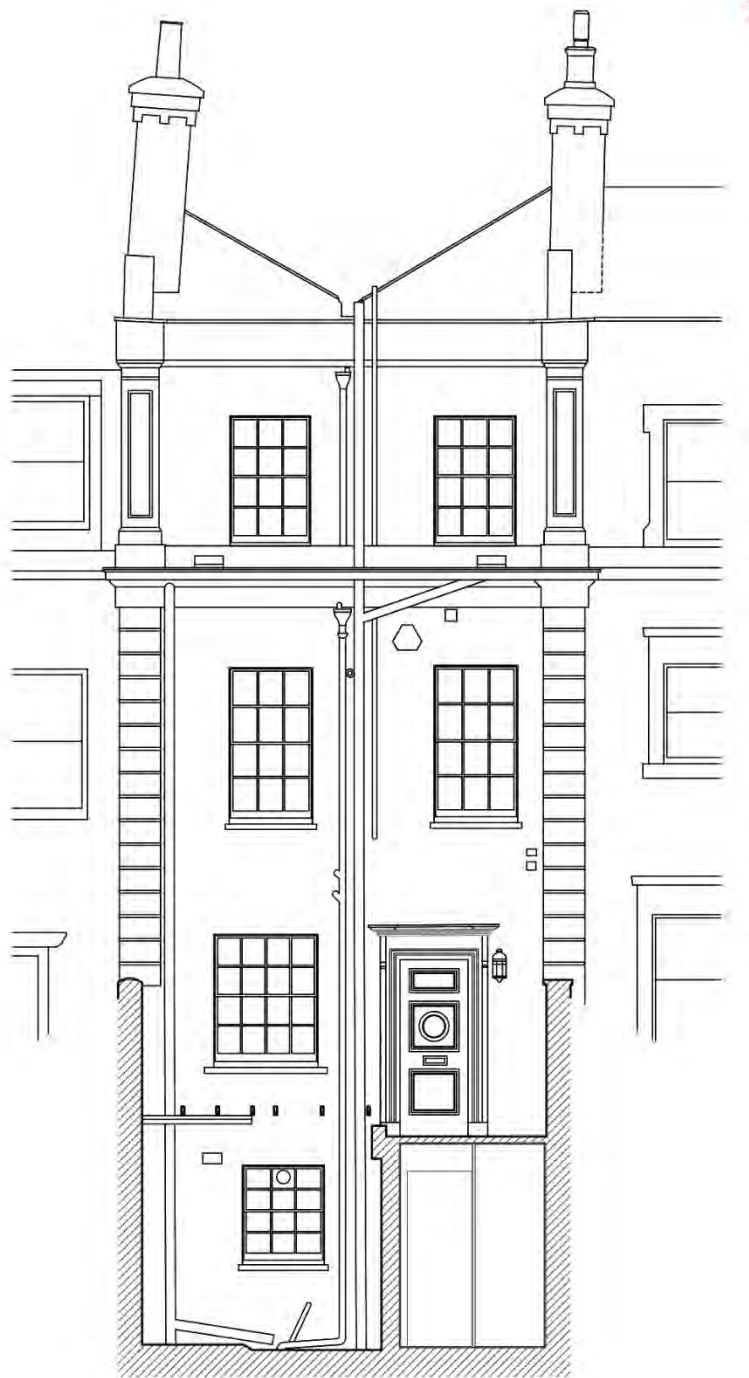
Existing Second Floor Plan:



Existing Roof Plan:



Existing Front Elevation:



Existing Rear Elevation:



Observations: Site Photos

Views of front elevation - Front chimney stack on left hand side (LHS) has significant lean inwards (approx 4-5"). Front elevation shows signs of cracking which suggest historic and recent settlement at foundation level.



Views of rear rooms at first and second floor levels. Note sag in lintel over window at 2nd floor level



Views of ceiling and roof structure at 2nd floor level: general view at front



Views of ceiling and roof structure at 2nd floor level: Note modern repairs to valley beam and to front gutter.



Views of ceiling and roof structure at 2nd floor level: Generally the timber members (common rafters, hip rafters, ceiling joists etc.) look undersized for the spans and show significant deflection. Poor repairs also visible



Views of ceiling and roof structure at 2nd floor level: Poor splice repairs to common rafters at front and cranked valley beam.



Views of ceiling and roof structure at 2nd floor level: Poor splice repairs to common rafters at front and cranked valley beam.



Views of ceiling and roof structure at 2nd floor level:

Poor splices.

Rafters and ceiling joists look undersized for spans. Timber support/connections at wall look poor and some have slipped.

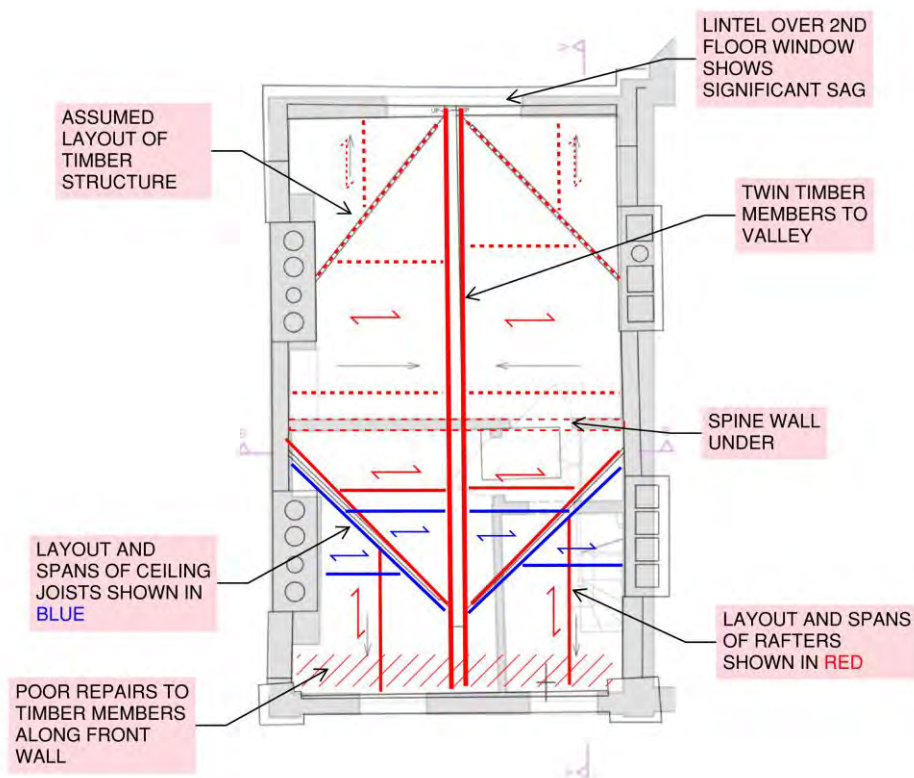


Views of ceiling and roof structure at 2nd floor level: front wall LHS



Observations

Plan at ceiling and roof level:



Access was made available to all levels. There was very limited access to the roof void in the areas where the ceiling was still in place. There was no access to the external roof and the leaning chimney stack was viewed from street level.

General:

There is a noticeable change in the floor levels at first and second floor near the front wall and around the loadbearing spine wall. This is also reflected at ceiling and roof levels.

Leaning Chimney Stack:

The stack is 2½ bricks thick (approx. 570mm) and is approximately 3.2m high. The stack leans by approx. 4"-5" from parapet level. The shaft wall thickness is expected to be ½ brick thick. The lean ratio is significantly higher than the 1mm:100mm limit recommended in the BRE Good Repair Guide 15. Also, the centre of mass of the shaft wall is outside the middle third of its width and as such is unstable.

Ceiling and roof members:

Generally, the timber members at ceiling and roof level appear undersized for their spans and display noticeable deflections. There is evidence of historic water ingress especially near the valley and front gutters and at the junctions with the perimeter walls. There is also some evidence of historic insect attack in some of the members.

Valley Beam:

This member comprises two approx. 190mmx50mm timbers and runs from the rear wall to the front wall, supported near the centre of the span by the spine wall. There is a poorly repaired crank with steel splice plates bolted to the timbers near the front wall where the beam drops down to sit on the brickwork wall. At the rear, the beam sits over a lintel to the rear window which has sagged significantly. There are several areas of visible decay in the beam.

Ceiling joists:

The ceiling members comprise primary joists which vary in size, running diagonally from the party walls to the valley beam. These support secondary joists (typically 70mmx55mm) which span side to side.

Rafters:

The roof members comprise common rafters (typically 80mmx50mm) which run from the brickwork walls to the valley beam or to the hip rafters. The hip rafters run diagonally from the party walls to the valley beam. The rafters near the front wall have all been repaired with poorly installed splice plates.

Comments

Leaning Chimney Stack:

The leaning chimney stack is unstable and should be carefully taken down, the bricks set to one side and the stack rebuilt in lime mortar. Preferably, this should be done once the building is scaffolded and a temporary roof is in place. As the stack is on the party wall, the works should be detailed and agreed with the Party Wall Surveyor. As the roof structure is likely to be contributing to the stability of the stack, it should be taken down before any roof works are commenced.

Ceiling and roof members:

Valley Beam:

Given the condition of the valley beam it is recommended that the entire beam is replaced with a pair of steel PFC beams, cranked at the front to meet the brickwork wall. The lintel over the 2nd floor rear window should be fully exposed as, the level of deflection in it suggests it may be decayed. A replacement precast concrete lintel should be considered. The new steels should be painted along their full length with an enhanced corrosion protection system as their location makes them susceptible to moisture ingress.

Ceiling joists:

Where retained, the ceiling members should be cut back and partnered with new deeper (and therefore stiffer) ones, with new joist hangers provided at supports. At wall junctions, it is recommended that the joists are re-supported on joist hangers off new timber wall plates bolted into the wall. Generally, where the timber wall plates are bolted into the masonry wall, they should be separated from the wall with a suitable membrane, in line with the recommendations from the timber condition survey by Hutton and Rostron.

Rafters:

Where retained, the hip rafters should be cut back and partnered with new deeper ones, supported off new joist hangers. At wall junctions, these should be re-supported on joist hangers off new timber wall plates bolted into the wall. The common rafters should be repaired in a similar manner to the ceiling joists with new ones partnered alongside the existing.

Other issues:

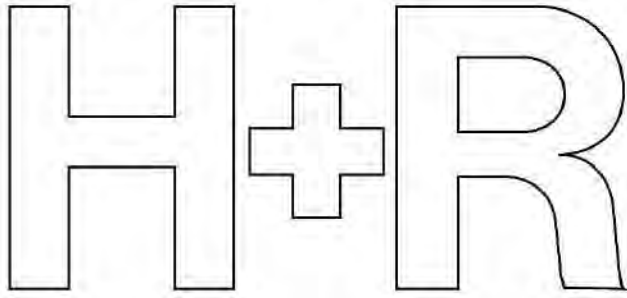
There appears to have been historic settlement in the front wall which may have affected the timber members supported by the front wall. The cracking noted in the front wall suggests some movement in recent years. Further investigations should be considered. A CCTV survey of the nearby below ground drainage and an inspection of the rainwater gully are recommended to establish their condition.

A series of limited investigations are also recommended in order to clearly ascertain the cause of the movements and to enable considered remedial action to be determined.

Document Control

		status:	PRELIMINARY		
Revision:	P1	prepared by:	Edney Ndumbe MEng MSc CEng MIStructE Conservation Accredited Engineer	checked by:	Matthew Bolton MEng CEng MIStructE
Date:	10.05.23	Signature:	EN	Signature:	MB

Condition Survey



ROOF TIMBER CONDITION INVESTIGATION

42 SOUTHWOOD LANE

JOB NO. 158-51



CHARLES HAMILTON

17 MARCH 2023

Prepared by:	Technical review by:	Administration by:
<i>Patrick Hughes MSc</i>	-	<i>Kim Meredith</i>

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- 3 Observations and Recommendations
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1 INTRODUCTION

1.1 AUTHORITY AND REFERENCE

Hutton+Rostron Environmental Investigations Limited carried out a timber condition investigation at 42 Southwood Lane on 17 March 2023 in accordance with instructions received from Charles Hamilton by email dated 16 March 2023. Reference was made to drawings supplied by Devise Engineers for the identification of structures. For the purpose of orientation in this report, the building was taken as facing west

1.2 AIM

The aim of this investigation was to assess the condition of the structural timber elements forming the roof structure and analyse the deep moisture contents that could provide the conditions for the onset of biological decay organisms, so that environmentally friendly and cost-effective remedial advice could be provided

1.3 LIMITATIONS

This survey was confined to the accessible structures. Concealed timbers and cavities have been investigated where necessary by the use of high-powered fibre optics. The condition of concealed timbers may be deduced from the general condition and moisture content of the adjacent structure. Only demolition or exposure work can enable the condition of timber to be determined with certainty, and this destroys what it is intended to preserve. Specialist investigative techniques are therefore employed as aids to the surveyor. No such technique can be 100 per cent reliable, but their use allows deductions to be made about the most probable condition of materials at the time of examination. Structures were not examined in detail except as described in this report, and no liability can be accepted for defects that may exist in other parts of the building. We have not inspected any parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect or in the event that such part of the property is not free from defect it will not contaminate and/or affect any other part of the property. Any design work carried out in conjunction with this report has taken account of available pre-construction or construction phase information to assist in the management of health and safety risks. The sample remedial details and other recommendations in this report are included to advise and inform the design team appointed by the client. The contents of this report do not imply the adoption of the role of Principal Designer by H+R for the purposes of the Construction (Design and Management) (CDM) Regulations 2015. No formal investigation of moisture distribution was made

1.4 H+R STAFF ON SITE

Patrick Hughes

1.5 PERSONNEL CONTACTED

Charles Hamilton – Devise Engineers

2 EXECUTIVE SUMMARY

2.1 OBSERVATIONS AND RECOMMENDATIONS

2.1.1 External roof coverings

The condition of external roof coverings was not investigated at the time of survey. Internal investigations within the roof void identified the presence of contemporary materials such as roof membranes and plywood at eaves level. This could indicate that the external roof coverings had possibly been partially or wholly refurbished recently

Consideration should be made for investigations to be undertaken to the external roof coverings to assess their suitability for continued use and to identify any defects or latent defects that may result in moisture penetration into the structure that could lead to vulnerable materials becoming saturated and increasing their vulnerability to the onset of biological decay organisms. H+R can provide further advice if instructed

2.1.2 Rainwater drainage systems

The condition of rainwater drainage systems were not investigated at the time of survey. Internal investigations into the roof void noted the presence of plywood at eaves level in certain areas. This was deemed to possibly be evidence of remedial works to defective guttering systems. The condition of internal plasterwork in certain areas also highlighted the possible failure of rainwater drainage systems in the past

Consideration should be made for investigations to the rainwater drainage systems to assess their suitability for continued use and to identify the presence of any blockages, issues or design defects that could inhibit function and increase the likelihood of overcharging, resulting in the saturation of vulnerable materials. H+R can provide further advice if instructed

2.1.3 Moisture penetration providing the conditions for decay

During investigations it was noted that there had been localised failure of internal plasterwork at the ceiling/wall junctions which suggested that there had been prolonged moisture ingress at those locations, possibly due to historic roof or rainwater drainage system failures. Widespread repairs to common rafters along the east side provided further evidence of moisture penetration in the past. Visible moisture staining, corrosion of mechanical fixings and localised instances of 'wet' rot decay, interstitial condensation and wood-boring beetle suggested there had been significantly elevated levels of humidity within the roof void prior to the removal of the lath and plaster ceiling cladding. Surface moisture readings of certain timbers were ~22%, which was above the threshold for the survival and growth of biological decay organisms

All efforts should be made to protect the internal structural elements from excessive levels of moisture before, during and after refurbishment. External roof coverings and rainwater drainage systems should undergo regular inspections as part of a thorough maintenance schedule and it should be ensured the roof void is provided with adequate levels of 'through'

and 'cross' ventilation upon future occupancy to allow for the escape of moisture laden air. H+R can provide further advice if instructed

2.1.4 Fungal decay infection

Localised evidence of fungal decay infection was noted at the time of survey. Due to its characteristics this was preliminarily identified as being a 'wet' rot fungal species, possibly *Coniophora puteana*. Internal moisture readings taken at the time of survey were below the threshold for the survival and growth of fungal decay organisms, therefore the instances of fungal decay were considered to be historic and no longer active

No chemical remedial treatments are required or recommended. All decayed timber members should be replaced or repaired using a suitable partner or scarf joint detail and suitable mechanical fixings and using a timber of a similar species. All vulnerable timber elements should be isolated from likely damp affected masonry and other materials using a damp-proof membrane and ventilated air gap of ~20/25mm. All remedial works should follow guidance from a structural engineer. H+R can provide further advice if instructed

2.1.5 Wood-boring insect infestation

Localised evidence of wood-boring beetle infestation was noted at the time of survey. Due to its characteristics this was preliminarily identified as being the Common Furniture Beetle (*Anobium punctatum*). Internal moisture readings taken at the time of survey were below the threshold for the survival and growth of wood-boring insects and no evidence of fresh frass or beetle carcasses were found, therefore the instances of infestation were considered to be historic and no longer active

No chemical remedial treatments are required or recommended. All decayed timber members should be replaced or repaired using a suitable partner or scarf joint detail and suitable mechanical fixings and using a timber of a similar species. All vulnerable timber elements should be isolated from likely damp affected masonry and other materials using a damp-proof membrane and ventilated air gap of ~20/25mm. All remedial works should follow guidance from a structural engineer. H+R can provide further advice if instructed

2.1.6 Structural issues

During investigations it was noted that certain jointing between structural elements had become separated and structural members such as ceiling joists were deemed to likely be undersized and featuring incorrect jointing methods for the loading they were required to take. Additionally, the type, condition and placement of certain historic mechanical fixings was also deemed to be inadequate. This had left the ceiling in what was considered to be an unstable state and had inhibited access to certain areas

The adequacy of all structural elements and their jointing should be assessed by a structural engineer. Allowances should be made for their replacement or re-support using contemporary hardware such as joist hangers and additional mechanical fixings where it is deemed necessary. Further allowances should be made for the possible introduction of additional elements to reduce the span of subsequent members. H+R can provide further advice if instructed

2.1.7 Previous remedial interventions

Widespread evidence for previous remedial interventions to the roof structure were noted. Generally these were seen to be adequate, however, the partner repairs and associated

metalwork to the lower sections of common rafters along the east side were deemed to possibly require intervention due to partial failure to some

The adequacy of the common rafter repairs should be assessed by a Structural Engineer and allowances should be made for replacement or further remedial works to take place where it is deemed necessary. H+R can provide further advice if instructed

2.1.8 Hazardous dust and debris

Significant levels of dust and debris were noted in the roof void during investigations. Excessive levels of dust and debris would present a significant health hazard to construction personnel and future occupants if not cleared due to the likelihood of loose dust particles becoming airborne when disturbed. Dust and debris within roof voids commonly contains hazardous materials such as residues from historic timber preservatives/treatments and often remnants of waste materials left after historic construction or remedial works, that can contain asbestos

All construction personnel and site visitors should wear adequate PPE when working within, or in close proximity to the roof void. The roof void should be cleared of all possibly hazardous dust and debris prior to refurbishment works taking place. All personnel involved in the removal of hazardous materials should be provided adequate training and PPE to carry out the task. All construction personnel and site visitors should be provided adequate PPE whilst removal works are taking place and suitable measures should be enacted to protect the general public from possible exposure. All waste materials should be disposed of in an appropriate, environmentally friendly manner

3 OBSERVATIONS AND RECOMMENDATIONS

3.1 CONSTRUCTION

3.1.1 History

Upon desk-based investigations the property appeared to have been designated a Grade II listing as part of a group, in 1974 (list entry no. 1079165). The property was reported to have been from the late 18th to early 19th century and the widespread use of softwood timbers to form the roof structure would support this, as it was during this period that Britain saw a significant increase in softwood timber importation from the Baltic states

3.1.2 Materials and arrangement

Formal timber species identification was not carried out during the investigations, however preliminary visual analysis deemed the historic timbers forming the roof structure to be formed of softwood, likely of the *Pinus* genus. Contemporary repair elements were also deemed to be softwood but may have been of Spruce (*Picea spp.*)

External roof materials were not identified at the time of survey. The roof structure appeared to be a hipped common rafter roof that featured a central trench that spanned east to west. Common rafters were jointed at their top ends to ridge boards that were fixed to the north and south party walls, common rafters were jointed to the corresponding ridge boards and rafter plates using mitred butt joints and via birds mouth joints at their feet. All joints were further secured using metal mechanical fixings

Ceiling joists were oriented both north to south and east to west and were found to be jointed at the perimeter of the roof void using notch joints to battens/plates that were themselves connected to the masonry, and to one another internally using butt or lap joints and mechanical fixings. Certain joist elements were deemed to be unsuitable/failing due to excessive spans and jointing arrangements that were seen to be failing at the time of survey, this is discussed further in section 3.2.3 below

3.1.3 Relevant dimensions

Common rafters	~80 x 50mm
Hip rafters	~170 x 35mm
Rafter plate	~200 x 55mm
Primary joists	~150 x 65mm
Secondary joists	~70 x 55mm and ~100 x 30mm
Gutter noggings	~70 x 60mm

3.1.4 Previous remedial interventions

Upon investigations it was noted that there had been a history of remedial intervention to the roof structure, with visible repair works to the lower sections of common rafters, entire rafter

and rafter plate replacements, contemporary roof membranes and plywood lengths at eaves level which were likely installed to replace historically defective external gutter elements. The exact chronology of the repair works was not ascertained and it was likely that certain elements were repaired at different times throughout the second half of the 20th and/or early 21st century. Certain elements were deemed to require further repair works due to improper/careless previous repair works

All previous remedial works should be investigated to ascertain adequacy for continued use. All remedial works should follow recommendations set out in sections 3.2.2 and 3.2.3 below. H+R can provide further advice if instructed

3.2 CONDITION

3.2.1 Water penetration providing the conditions for damp and decay

During investigations it was noted that there had been localised failure of internal plasterwork at the ceiling/wall junctions which suggested that there had been prolonged moisture ingress at those locations, possibly due to historic roof or rainwater drainage system failures. Widespread repairs to common rafters along the east side provided further evidence of moisture penetration in the past. Visible moisture staining, corrosion of mechanical fixings and localised instances of 'wet' rot decay, interstitial condensation and wood-boring beetle suggested there had been significantly elevated levels of humidity within the roof void prior to the removal of the lath and plaster ceiling cladding. Surface moisture readings of certain timbers were ~22%, which was above the threshold for the survival and growth of biological decay organisms

All efforts should be made to protect the internal structural elements from excessive levels of moisture before, during and after refurbishment. External roof coverings and rainwater drainage systems should undergo regular inspections as part of a thorough maintenance schedule and it should be ensured the roof void is provided with adequate levels of 'through' and 'cross' ventilation upon future occupancy to allow for the escape of moisture laden air. H+R can provide further advice if instructed

3.2.2 Timber decay and defects

- 1 Overview: Full access was not available to all areas of the roof structure due to the instability of the ceiling joists. Investigations were carried out to exposed and accessible areas both visually, as well as physically using deep drilling and probing techniques to assess the presence and severity of any decay, as well as the deep moisture levels of certain timbers that could allow for the onset and growth of biological decay organisms. A significant amount of superficial decay was identified to structural timber elements; however, this had generally only affected the sapwood bands and was deemed to likely be historic. Localised areas of structural decay were identified (see Plans in Attachment B), these instances were in locations that had been subjected to prolonged moisture penetration and/or a build-up of moisture-laden air that had raised internal moisture levels of affected timbers, allowing the infestation/infection of both fungal and insect decay organisms
- 2 Structural decay: Several structurally decayed timber elements were identified throughout the roof void, these include:
 - 1 no. rafter at the south-west of the roof structure, in contact with chimneybreast was decayed at its top section for ~400mm
 - 1 no. diagonal strut at the south-west of the roof structure that was embedded into the chimneybreast was decayed at its lower bearing end

1 no. section of central rafter plate was decayed for ~380mm at the west side, within the east room

1 no. ceiling joist adjoining the central rafter plate was decayed at the adjoining end for ~410mm

1 no. section of ridge board that was fixed to the east side of the north party wall was found to have split for ~730mm

No chemical remedial treatments are required or recommended. All decayed timber elements should be replaced or repaired using a suitable partner or scarf joint detail and mechanical fixings, using a timber of a similar species. All timber members should be isolated from likely damp affected masonry using a damp-proof membrane and ventilated air gap of ~20/25mm, or cut back and re-supported using hangers/brackets. All remedial works should follow guidance from a Structural Engineer, and in consultation with the Architect and Conservation Officer. H+R can provide additional strength grading information to aid in loading calculations if required and if instructed

3.2.3 Structural issues

As well as the instances of decay to structural roof timbers, further issues were observed, these would include the likely inadequate jointing of joists to battens/plates at the perimeter of the roof void, these were considered to be undersized with inadequate fixings. Additionally the internal jointing arrangements of ceiling joists included butt joints, both mitred and square which were seen to be separating in some locations, possibly due to the weight of the historic ceiling cladding and other elements within the roof. Furthermore, certain ceiling joists were seen to have lap joints that were oriented the incorrect way to support loading from above, these also had very thin timber forming the 'lap' of the joint which could lead to the increased likelihood of failure over time

All ferrous metal mechanical fixings within the roof void were seen to be suffering varied levels of corrosion. This was likely due to historic moisture ingress at certain locations, but primarily because of no formal provisions for ventilation allowing the ambient humidity within the roof void to become excessively raised

Allowances should be made for all structurally inadequate or separated bearing ends to be reformed or re-established using mechanical fixings, with adequate strengthening and/or support where deemed to be necessary. All remedial works should follow guidance from a Structural Engineer, and in consultation with the Architect and Conservation Officer. Further allowances should be made to increase levels of 'through' and 'cross' ventilation within the roof void, to allow for excessive levels of humidity to escape. H+R can provide further advice if instructed

3.2.4 Hazardous materials

It was noted that the roof void contained large quantities of dust and debris which were considered likely to contain numerous hazardous materials that could present a danger to the health of construction personnel and future occupants

All hazardous dust and debris should be cleared from the roof void prior to refurbishment works commencing. All personnel involved in the removal of possibly hazardous material should undergo appropriate training. All personnel directly involved in the removal of hazardous materials and those in close proximity should be provided adequate PPE. Efforts should be made to prevent exposure to possibly hazardous materials before, during and after refurbishment and all waste should be disposed of in the correct, environmentally friendly manner

4 GENERAL RECOMMENDATIONS

All new and refurbishment detailing should be assessed for its effect on environmental and structural health. General principles are set out below. Special care is required when introducing new materials, moisture sources or heating and ventilation systems, for example air conditioning

4.1 ROOF AND SURFACE DRAINAGE

4.1.1 Maintenance

All guttering, hopperheads and outlets should be regularly checked and cleared to keep them free of debris, especially during the autumn months

4.1.2 Protection

Hopperheads, gutter outlets and ground gullies should be protected with metal mesh cages so as to prevent blockage and overflow. These should extend higher than the expected water level to reduce the tendency to block and should be easily removable to allow cleaning and maintenance

4.1.3 Overflows

Hopperheads, parapet gutter outlets and valley gutter outlets should be fitted with overflow pipes to drain water clear of the structure in case of blockage. These should be at a level below that at which water would overflow the roof flashings

4.1.4 Access

Safe and convenient access ladders, safety points and walkboards should be installed to all roof areas to allow proper inspection and maintenance

4.1.5 Pigeons

Feral pigeons should be controlled. H+R can give advice on this if necessary

4.2 VENTILATION

4.2.1 Structural voids

All structural voids within the building should be provided with adequate through ventilation so as to prevent moisture build-up. This must be done with regard to the applicable fire regulations

4.2.2 Chimneys

All chimneys not in use should be capped so as to minimise water ingress but so as to allow maximum ventilation of the flues. Flues should be cleared and cleaned to remove blockages. Fireplaces and chimney breasts should be opened or vented to allow through-ventilation of the flues. This prevents moisture build-up in the flues and helps interior ventilation by the stack effect

4.2.3 Bathrooms and kitchens

All bathrooms and kitchens should be fitted with adequate extractor fan systems. These should run for at least fifteen minutes after occupancy to prevent condensation. The installation of floor drains should be considered in these rooms in case of overflow

4.2.4 Roof spaces

All roof spaces, including flat roof areas and gutter soles, should be provided with adequate through-ventilation. This may occur via the gaps between slates in unsarked pitched roofs. However, flat roofs and pitched roofs with sarking or insulation will require the installation of vents through the roof surfaces or at the eaves and ridges. Insulation material in roof spaces should be kept clear of external walls, gutter soles or timbers in contact with damp or potentially damp masonry

4.2.5 Windows

Windows should be refurbished so as to allow easy and convenient opening and closing by occupants in order to encourage proper ventilation of the building. This is important both for environmental and structural health. Windows should be fitted with security locks so as to allow secure locking in a partially opened position

4.3 STRUCTURAL DETAILING

4.3.1 New timbers

New timbers should be isolated from any damp or potentially damp masonry with a damp proof material or ventilated air gap

Appendix A



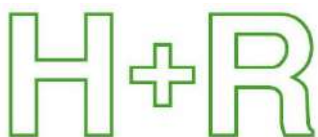
Fig 1:

Internal, second floor; showing a general view of the west room, looking west



Fig 2:

Internal, second floor; showing a general view of the west room, looking east



42 Southwood Lane

Photographs

17 March 2023

Not to scale

Hutton + Rostro Environmental Investigations Ltd, Notley House, Go shall, Surrey, GU5 9QA

Tel: 01483 203221 Email: ei@handr.co.uk

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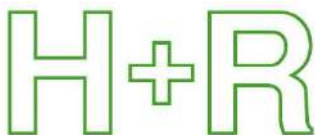
Fig 3:

Internal, second floor; showing a general view of the ceiling of the west room. Note the positioning of localised cavities exposing structural elements and the general deformation and cracking of the ceiling cladding



Fig 4:

Internal, second floor; showing a general view of the west side of the west room. Note the positioning of the cavity and the deflection to the ceiling and the window. Consideration should be made for further investigations into the condition of lintels within the property



42 Southwood Lane

Photographs
17 March 2023
Not to scale



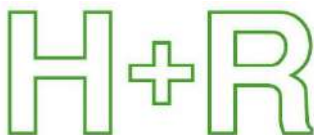
Fig 5:

Internal, second floor; showing a view of localised damage to internal plasterwork within the west room, likely due to historic failings of the external gutter allowing excessive moisture to saturate masonry, leading to the decay and damage of subsequent materials



Fig 6:

Internal, second floor; showing a general view of the cavity located at the west side of the west room



42 Southwood Lane

Photographs
17 March 2023
Not to scale



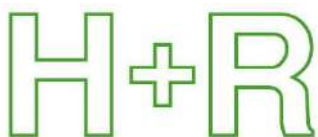
Fig 7:

Internal, roof void; showing the condition and structural arrangement of timber elements within the roof void at the south-west. Note the presence of several contemporary elements indicated recent remedial works had been undertaken, likely to replace decayed elements forming the roof and external gutter



Fig 8:

Internal, roof void; showing a general view of the structural arrangement of the roof structure. Note the positioning of timber elements in close proximity and contact with likely damp affected masonry



42 Southwood Lane

Photographs

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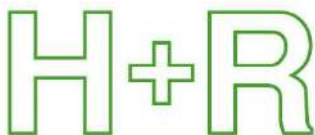
Fig 9:

Internal, roof void; showing a focused view of the bottom end of a diagonal strut that was found to be decayed where it had been embedded into the brickwork, at the south-west of the roof void



Fig 10:

Internal, roof void; showing a common rafter at the south-west of the roof structure, in contact with the masonry chimneybreast. Note the common rafter was found to be decayed at its top end for ~400mm



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Fig 11:

Internal, roof void; showing a focused view of the notched jointing of ceiling joists to the corresponding joist plate at the south-west of the roof structure. Depending on the future purpose of the ceiling joists after refurbishment this arrangement may be inadequate to support significant loads



Fig 12:

Internal, roof void; showing a focused view of the south-west corner of the roof void which featured a historic wasps nest



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Fig 13:

Internal, roof void; showing a focused view of the hip rafter at the south-west of the roof structure. Note the likely decayed jack rafters



Fig 14:

Internal, second floor; showing a general view of the condition of the east room



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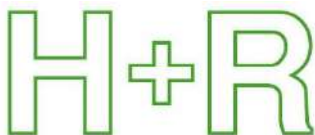
Fig 15:

Internal, second floor; showing a general view of the exposed roof structure visible within the east room. Note the presence of contemporary repairs at eaves level that indicated previous failures and recent remedial intervention



Fig 16:

Internal, second floor; showing multiple partner repairs to docked common rafters at the east of the roof structure. Note that some of these were seen to be failing and of poor quality



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Fig 17:

Internal, second floor; showing 2 no. sections of decay to a rafter plate and a ceiling joist. The fungal decay organism was deemed to be a 'wet' rot species and the moisture reading was seen to be below the threshold for the survival and growth of fungal decay organisms



Fig 18:

Internal, second floor; showing significantly elevated surface moisture readings to certain elements within the east roof structure. These were deemed to likely be due to high levels of humidity



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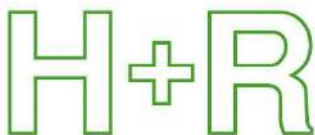
Fig 19:

Internal, second floor; showing slightly elevated surface moisture readings of common rafters at the west of the roof structure. This was deemed to be due to previous elevated humidities within the roof void, as opposed to active leaks through external roof materials above



Fig 20:

Internal, roof void; showing a general view of the north lean-to roof pitch. Note the presence of contemporary roof membrane



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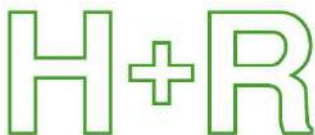
Fig 21:

Internal, roof void; showing a focused view of superficial decay to the underside of a common rafter forming the south pitch. The decay organism was preliminarily identified as being House Longhorn beetle (*Hylotrupes bajulus*)



Fig 22:

Internal, roof void; showing a general view of the arrangement of timber elements at the top of the north pitch. Note the upper lean-to rafter plate was found to be splitting for ~750mm



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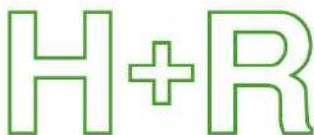
Fig 23:

Internal, roof void; showing the lower section of a common rafter forming the north pitch of the roof structure. Note that recent partner repairs were identified



Fig 24:

Internal, roof void; showing the presence of a contemporary hanger embedded into the north wall within the roof void, used to support the bearing end of a length of purlin that had likely been a recent installation during previous refurbishment works



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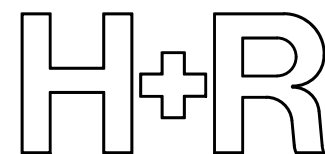
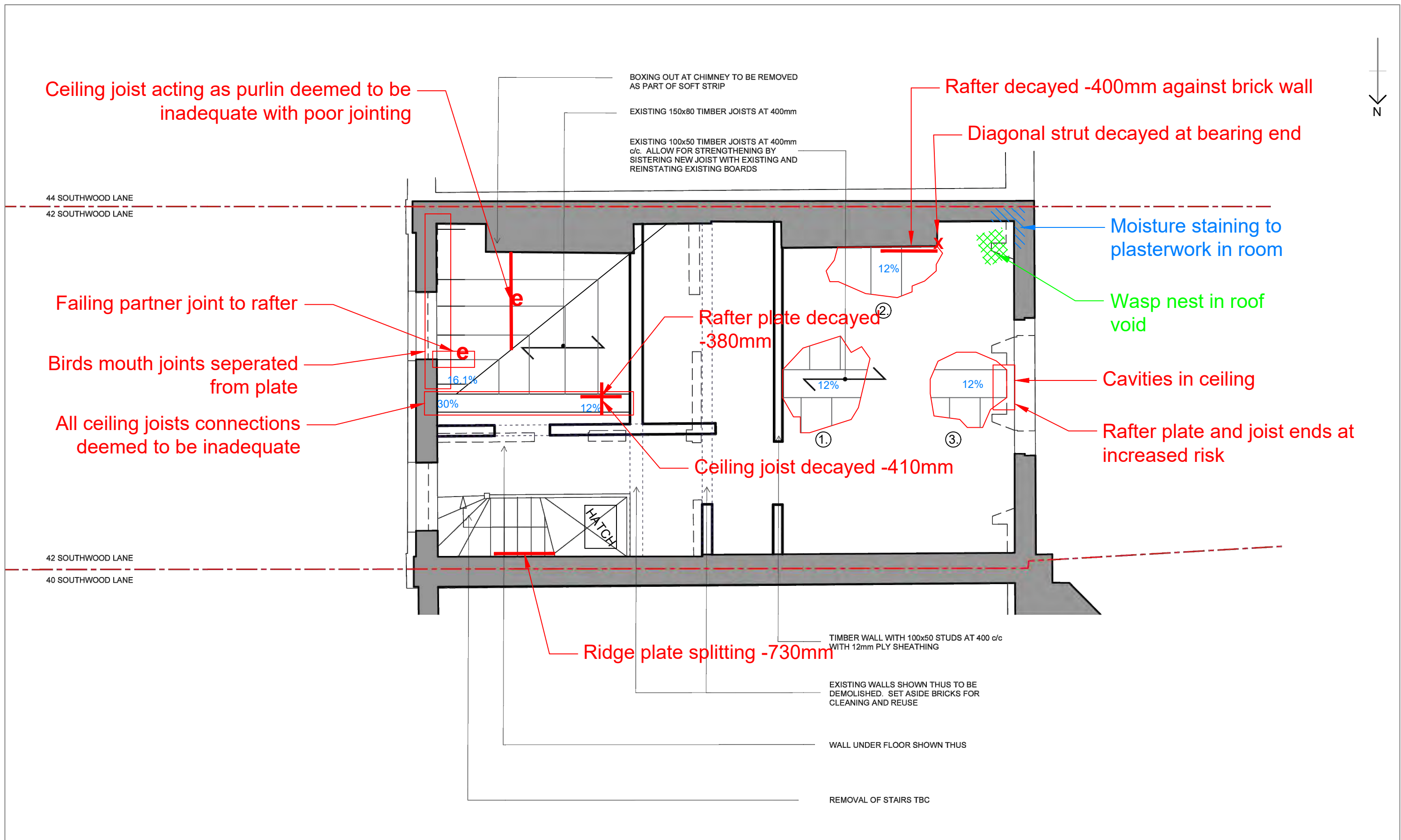
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Appendix B



42 South Wood Lane - Second Floor Plan
Condition Survey
March 2023

Hutton + Rostron Environmental Investigations Ltd
Netley House, Gomshall, Surrey, GU5 9QA Tel: 01483 203221
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Key: X Decayed bearing end of lintel / joist or beam
— Structurally decayed/defective timber element
/// Area subject to water penetration providing the conditions for damp and decay
<10% Level of moisture content
e Structural engineer to comment

Method Statement

Method statement: Remedial works to Chimney Stack

42 Southwood Lane, N6 5EB

As per conservation engineer's report:

The stack is 2½ bricks thick (approx. 570mm) and is approximately 3.2m high. The stack leans by approx. 4"-5" from parapet level. The shaft wall thickness is expected to be ½ brick thick. The lean ratio is significantly higher than the 1mm:100mm limit recommended in the BRE Good Repair Guide 15. Also, the centre of mass of the shaft wall is outside the middle third of its width and as such is unstable.



Figure 1 - Front chimney stack on left hand side has significant lean inwards

Method:

1. Erect scaffolding around property and install a temporary roof covering. Scaffold should have loading gantry, guard rail and a winch to lower materials down to the ground in order to store and reuse.
2. Install safe working platform around chimney breast; assumed to be supported off front and rear scaffold with edge protection
3. Provide protection to neighbouring roof, No. 44.
4. Cover up surrounding area as far as reasonably practicable in order to contain soot. Temporarily seal fireplaces with cellophane.
5. Remove the chimney pots, lower down to ground level and store safely in order to reuse.
6. Remove the bricks individually by drilling through the mortar and using hand tools to loosen the brick; keeping as many bricks intact as far as reasonably possible.
7. Lower the bricks down to ground level.
8. Existing bricks to be cleaned and assessed for reuse, if any new bricks are required, they are to match the existing and be mixed in with the existing bricks.
9. Once the chimney has been taken down to roof level, rebuild it plumb using lime mortar to match existing form and detailing.
10. Once chimney has been reinstated as existing, continue roof remediation works.

Structural Drawings

EXISTING LEANING CHIMNEY STACK IS TO BE CAREFULLY TAKEN DOWN AND BRICKS TO BE SET ASIDE FOR REUSE. BRICKS TO BE CLEANED AND REUSED WHERE POSSIBLE TO ALLOW RECONSTRUCTION OF STACK WITH LIME MORTAR. ADDITIONAL REUSED STOCK BRICKWORK TO MATCH EXISTING ARE TO BE SOURCED AND MIXED IN WITH SITE BRICKS TO ACCOUNT FOR SHORTFALL DUE TO ANY DAMAGED BRICKS

EXISTING 100x50 TIMBER JOISTS AT 400mm c/c. WHERE DECAY IS PRESENT RAFTERS TO BE PROPPED, CUT BACK AND SISTERED WITH NEW 100X500 JOISTS BOLTED WITH M12 BOLTS AT 450 c/c

EXISTING WALL PLATES THROUGHOUT TO BE REPLACED AND SEPERATED FROM MASONRY WITH A SUITABLE MEMBRANE.

JOISTS AND RAFTERS SHOULD BE PROPPED, CUT BACK AS REQUIRED AND RE-SUPPORTED ON NEW WALL PLATES VIA MILD STEEL JOIST HANGERS

PROVIDE 1.0m LONG STRAPPING OF RAFTERS TO WALL AROUND PERIMETER AT 1200mm CENTRES FIXED TO ADDITIONAL NOGGINGS TO BE INSTALLED PERPENDICULAR TO JOISTS AS REQUIRED

2No EXISTING 200x80 TIMBER VALLEY BEAMS SPACED 400mm APART. EXISTING VALLEY BEAMS TO BE REPLACED BY CRANKED 150x75 PFC STEEL SECTION. PFCs TO BE PAINTED WITH BITUMEN ALONG THERE FULL LENGTH

EXISTING LINTEL ASSUMED TO BE DECAYED. CONTRACTOR TO REPLACE TIMBER INNER LINTEL WITH A NAYLOR ER2 CONCRETE LINTEL

EXTERNAL BRICK LINTEL TO BE PINNED BACK TO CONCRETE LINTEL USING ANCON STAIRIB BARS AT MAXIMUM 225mm c/c

PROVIDE 2 COURSE HELIBAR AT 150MM VERTICAL c/c 2 COURSES ABOVE BRICK LINTEL. HELIBARS TO EXTEND 450MM BEYOND END OF LINTEL

100x50 EXISTING RAFTERS TO BE SISTERED WITH NEW 150x50 RAFTERS BOLTED WITH M12 BOLTS AT 450c/c

HISTORIC STUD WORK STRENGTHENING RETAINED

ALLOW FOR TRIMMING JOISTS AROUND OPENING BY SISTERING EXISTING JOISTS

HISTORIC SPLICING FOUND TO BE IN POOR CONDITION. ALLOW FOR PROPPING, CAREFULLY REMOVING PREVIOUS. REPAIR-JOISTS AND SISTER ORIGINAL JOISTS WITH NEW 150X50 C24 RAFTERS.

DEVISE.

CHARTERED STRUCTURAL ENGINEERS | SUSTAINABLE DRAINAGE DESIGN | PARTY WALL DESIGN-FOCUSED SUSTAINABILITY-DRIVEN ENGINEERING

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T1	11.05.23	CH	GS	Issued for tender
P2	16.12.22	DP	GS	Issued for info
P1	29.11.22	DP	GS	Issued for info
Rev	Date	By	Chk	Description

DO NOT SCALE FROM THIS DRAWING | READ IN CONJUNCTION WITH SPECIFICATION AND ALL OTHER CONSULTANT'S INFO

TITLE
ROOF

PROJECT
SOUTHWOOD LANE

STATUS
T1

SCALE
1:50@A3

DATE
NOV 2022

PROJECT NO
22088 - DV - RF - S -1030

ORIGINATOR LEVEL
ROLE

DRG NO

REV

TENDER

42 Southwood Lane, N6 5EB

DEVISE ENGINEERS

Appendix 1

Terms and limitations:

- The appointment for the inspection and report is in accordance with ACE Agreement II
- This report was carried out without receipt of any further information from the Client unless specifically stated
- Access was available to those areas stated only
- No intrusive investigation was carried out nor was it possible to view behind furniture and fittings
- This report written in relation to the structural aspects of the building only
- This report is strictly for the use of the Client stated and should not be relied upon by any third party
- Copying of this report for third parties is prohibited without express consent.