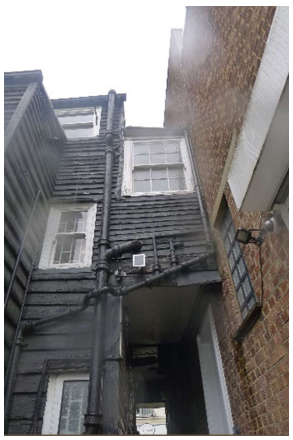
INTRODUCTORY NOTES – 114 HEATH STREET
Review of the options for retrofit for thermal insulation

Richard Oxley, Oxley Conservation. April 2024

No. 114 on the left and No. 122 on the right

No. 114 front elevation

No. 114 rear elevation



Rear elevation details

List description:

No. 112 and No. 114 Heath Street are both listed Grade II on the same list entry for their group value [GV].

The list entry is brief, describing the buildings as follows:

2 terraced houses with later shops. Early/mid C18. Timber-framed; No.112, refurbished with C20 weatherboarding; No. 114, stucco with dormer; No. 114, old tiled roof with dormer. 2 storeys and attics. 2 windows each. Both with C20 shopfronts. Flush framed sashes with exposed boxing, No. 112, C20. Picturesque rear elevations of weatherboard and brick. INTERIORS: not inspected.

112 AND 114, HEATH STREET, Non Civil Parish - 1378845 | Historic England

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Brief description:

No. 114 Heath Street is one of a pair of surviving 18th century [list description] timber-framed buildings located within the Hampstead Conservation Area.

The building is sub-divided into two uses, a ground floor shop unit, currently used as a barbers, and residential accommodation on the first and second/attic floors.

There is a shared passageway at ground floor level that runs from Heath Street to the rear [east]. This passageway may be subject to rights of way, as it provides access to houses in Stamford Close courtyard. The entrance door to the first and second floor accommodation of No. 114 is located in the passageway. There is a staggered party wall line between No. 114 and No. 116 which results in the front of the passageway being below the first floor accommodation of No. 116 and the rear of the passageway being below the first floor bathroom of No. 114.

The inspection of No. 114 revealed that the walls are, primarily, traditional timber-framed clad with painted weatherboarding to the rear elevations with the front [west] first floor elevation being rendered and painted; this wall is relatively thin and is, most probably, single skin 100mm brickwork. The render is modern and is most likely cement based.

The main roof comprises of pitched roof slopes covered in natural [Welsh] slate. There is a central flat roof, which may have been added to remove internal valley features, and associated problems, and a flat roof dormer to the south slope. Access was not gained onto the roof to inspect the roof slopes and coverings and the constructional detailing and/or condition of the roofs cannot be confirmed.

The inspection of the underside of the roofs, from access hatches and opened-up areas, revealed that the roof slopes have been recovered relatively recently, it is anticipated with the last 10 years or so. When the roof was recovered softwood timber repairs were carried out and a secondary barrier/roofing felt was installed.

Modern softwood joists were exposed by opening-up work to the ceiling of the first floor bathroom. This shallow pitched [flat] roof is not visible externally from ground level.

The ground floor shop front is modern, 20th century, and projects forward of the original line of the front wall of the building. The interior of the shop was not inspected.

Summary of condition:

The main concerns are the failures in the roof structure and coverings to the south dormer, which have resulted in water penetration and damage to internal finishes. The dormer was constructed by cutting of the rafters to the south slope without the provision of structural improvements. Consequently, the timbers deflected and this resulted in failure of the roof coverings.

The roof slope to either side of the dormer to the front roof slope sags/deflects, this reflects that timbers were most likely cut and/or removed to accommodate the dormer. Within the recent roof works the rafters have been 'doubled-up' by fixing softwood timbers to the existing rafters. The opportunity to reduce, or remove, the sagging in the roof slope was not taken.

The roof was recovered with a modern roofing felt. It does not have the appearance of a vapour permeable membrane, if that is the case it will increase the risks of condensation and associated problems.

The insulation detailing to the shallow pitched [flat] roof above the first floor bathroom is poor and would benefit from upgrading.

A limited inspection of the roof spaces was made. It was noted that the fire break/party walls between No. 114 and No. 112 are not present or not complete. There is, consequently, a risk of spread of fire between the two buildings.

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Opportunities for thermal improvements:

No. 114 currently has minimal insulation. Where visible the insulation is limited and, where present, poorly detailed. The sloping ceilings to the attic/second floor accommodation are not insulated. Consequently, the building will have a poor performance and will be suffer from excessive heat loss and heat gain.

The proposed stripping and recovering of the roof slopes would provide the opportunity to implement improvements to the structural detailing and performance of the roofs and to introduce well detailed thermal insulation to reduce excessive heat loss and heat gain. The stripping of the roof coverings would also provide the opportunity to upgrade the party fire break walls in the roof spaces with No. 112.

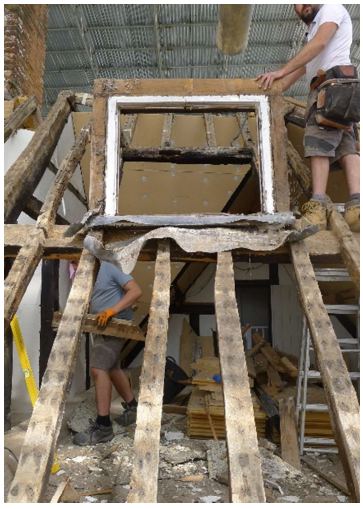
The lightweight timber-framed construction of the external walls, in particular to the rear, does not have sufficient thermal mass to help the building manage fluctuations in temperature and will as a result suffer from relatively significant fluctuations in heat gain and heat loss. A planned programme of work would provide the opportunity to improve the performance of the building and comfort levels for the occupants, as well as reducing carbon emissions.

Insulation - roof

For the roofs I would look to provide warm roofs [insulation over the rafters] wherever possible, as this makes the detailing easier and reduces the risks of creating cold bridges – attention to detail is needed at junctions as each one will be different.

To keep the roof as thin as possible a wood-fibre board [35mm] over the rafters and wood-fibre flexi insulation between the rafters [100mm] would be a good starting point. You will need to factor into any design details the build-up the introduction of counter battens – say 25mm and the thickness of the wood-fibre sarking board/insulation – say 35mm. An example of this build up is shown on the attached PDF with annotated photos [different product used – Isolair not STEICO] and the sketch of the typical eaves detail attached.

NOTE: it is important to allow for the increase in the depth in the roof slope where a warm roof is provided as this changes the relationship with the dormers and, in particular, the window sill detailing. Refer to the photos below showing the difference in detailing; where the face of the dormer has to be brought forward – compare the relationship of the front of the dormer with the purlin – so that the window sill is clear of the raised roof line.



Where ceilings have been replaced, or are in a poor condition, there is an opportunity to use insulation boarding for the ceiling, which would add thermal mass to the roof and improve the performance against over-heating without any loss of space.

The STEICO products supplied by Back To Earth are what have been used on recent retrofit projects. Back To Earth are a good source of information and products; their specification generator is useful for exploring options and seeing what works with each individual element of the building.

Sustainable Insulation, Building Materials & Systems | Back To Earth

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Ventilation

Slate and lead roofs and abutments. It is important with slates to provide ventilation, particularly when the roof and/or walls are insulated.

A comprehensive range of vents can be found using AirTrak; for pitched roofs [different pitches] and flat roofs.

AT_brochure_Nov20.pdf (nicholsonsts.com)

Front dormer

Refer to notes above.

Lead flat roof, slate cheeks. Perhaps consider to change the slate cheeks to lead [?]. No. 112 dormer has lead cheeks.

I have attached a PDF of annotated photos of the insulation to a dormer – which shows the build-up and detailing to dormer cheeks; the aim of the detailing was to keep the face of the dormer as 'thin' as possible, as it is easy to bulk out the dormer by adding insulation to the cheeks. The detailing of the front dormer, in particular, needs care so it doesn't look too 'chubby'.

Insulation – external walls

Timber-framed weatherboarded elevations:

The principal considerations include the need for:

- Careful removal of weatherboarding, particularly for historic boarding.
- The need to extend/provide timber weathering boards that separate the windows and the weatherboarding – refer to photo below, this example is insulation installed behind mathematical tiles rather than weatherboarding. The red arrow shows an increased depth in the weathering board to accommodate the insulation [35mm] and the counter-battens.

- The removal and reinstatement of external plumbing and rainwater goods together with adjustments needed to accommodate the changes [refer to photo above].
- Once external cladding is removed the timber frame can be assessed and repairs implemented as found necessary.
- Insulation can be fitted between the studs – anticipated as being 100mm wood-fibre flexible insulation.
- The fitting of wood-fibre insulation boarding [35mm], counter battens and then reinstating removed and/or new weatherboarding.
- Reinstatement of external plumbing and rainwater goods.

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Timber-framed/single skin front elevation:

The constructional detailing of the first floor front elevation was not confirmed. The wall is relatively slender and it is anticipated that it is approx. 100mm thick, possibly single skin brickwork, with a painted render externally.

The surface area of the wall to the first floor front elevation is not significant, particularly with the two window openings. Nevertheless, it would prudent to provide, where possible, an insulated wall and windows, to reduce the risk of this wall, and windows, being susceptible to condensation. External wood-fibre insulation with a rendered finish would work well, especially for such a thin wall, together with an internal insulating plaster where historic plasters are not present.

Windows:

Single glazed windows would benefit from improvements to their thermal performance this can be achieved by:

- Overhaul and draught-proofing – to make the windows functional and reduce draughts.
- Provision of secondary glazing.
- Replacement with double glazed units [the use of 'slim-line' units may be permissible, but there are reported issues with the longevity of some the slender double glazed windows].

Single glazed windows will be prone to condensation, particularly where the remainder of the building has been insulated.

Moisture extraction:

Within any thermal improvements it is imperative that improvements in the management of internal water vapour/moisture are made. This is most effective by removing water vapour at source, such as in the kitchen and bathroom. This can be achieved by the fitting of mechanical extractors, which can be fitted with humidity sensors. The use of vapour permeable materials, such as wood-fibre, will provide some 'buffering' in managing fluctuations in internal water vapour and humidity.

Floors:

Flooring elements | James Hardie Europe GmbH (fermacell.com)

The main challenge in making improvements in performance of the floors is overcoming the impact that any increase in the depth of the floor has within the accommodation, for example skirting details and reduced head room in doorways. The most effective means of improving fire protection/resistance is to install boarding to the underside of the ground floor ceiling; it is anticipated that this is not an option as the shop below is in separate ownership.

Improvements in acoustic insulation can be achieved with combined fire insulation; particularly to the first floor as impact noise should not be an issue from the ground floor shop. It would be prudent to ensure that the 'ceiling' of the external passageway and/or the floor above is provided with both thermal insulation and fire protection.

Working sketches used when exploring the options for fire and acoustic insulation on a building where there were going to be mixed uses, illustrates a potential solution for the first floor; the Hush products designed to reduce impact noise are not necessary in this particular case.

The attached Fermacell Handy Guide [I couldn't find an up to date version] provides some good details for floors and walls.

Party walls:

Shaftwall | British Gypsum (british-gypsum.com)

This system is useful where there is only access to one side of a wall; this system was used in a medieval mid terraced building where fire separation and acoustic insulation had to be provided where access to both sides of the party walls was not available. This may be an option where modern linings are present – each wall will be different and need individual solutions [unfortunately]. If the system itself isn't used it can provide ideas for detailing and materials.