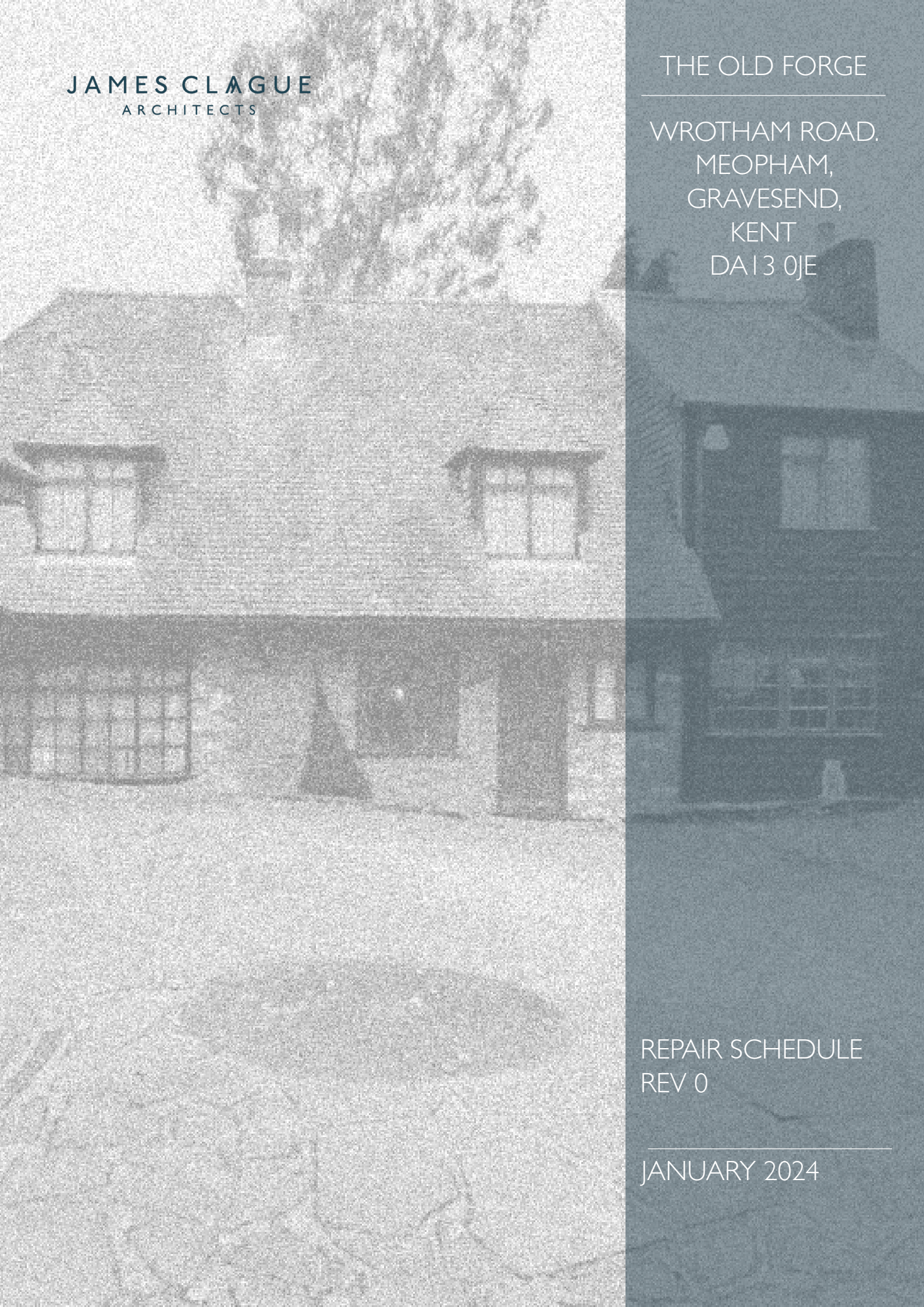




JAMES CLAGUE
ARCHITECTS

THE OLD FORGE

WROTHAM ROAD,
MEOPHAM,
GRAVESEND,
KENT
DA13 0JE

REPAIR SCHEDULE
REV 0

JANUARY 2024

FOREWORD

This document has been produced to accompany the application for approval of details reserved by condition following the grant of planning permission or a listed building consent under the Town and Country Planning Acts from Gravesham Borough Council for internal and external alterations and repair works

at

The Old Forge, Wrotham Road, Meopham, Gravesend, Kent, DA13 0JE

Issue/ Revision	Date	Description
Rev 0	January 2024	

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1. INTRODUCTION

Listed building consent application reference: 20200655

Applicant: Mr Crispin Walker-Buckton

Proposal: Alterations and refurbishment of main house to include new flat roofs, new windows and doors.

Address: The Old Forge, Wrotham Road, Meopham, Gravesend, Kent, DA13 0JE.

This document has been produced to accompany the application for approval of details reserved by condition 5 following the grant of listed building consent for the above application.

Condition 5

Prior to the commencement of the works hereby approved a detailed repairs schedule showing the extent of repairs and alterations, including how it is intended to retain the acknowledge heritage elements of the Listed building shall be submitted for prior approval in writing by the Local Planning Authority. The development shall thereafter be carried out in accordance with the approved details.

Reason: No such details have been submitted and in order to ensure special regard is paid to protecting the character and appearance of the Listed Building and Hook Green Conservation Area pursuant to Policy CS20 of the Gravesham Local Plan Core Strategy (2014) and saved policy TC3 of the Gravesham Local Plan First Review (1994).

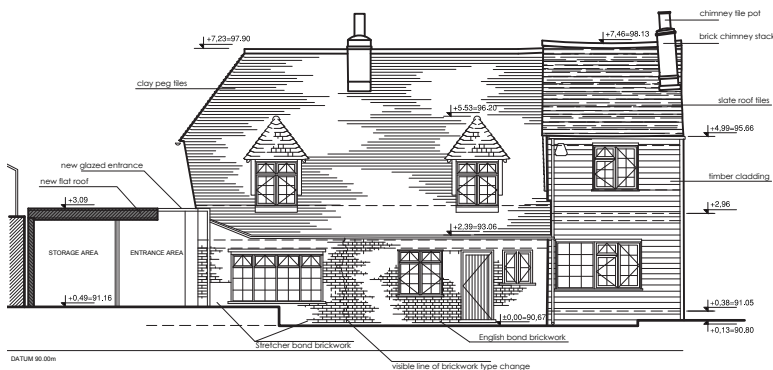


Fig.1 - Proposed North East Elevation.

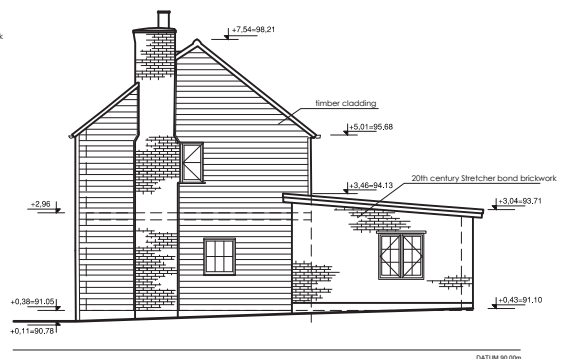


Fig.2 - Proposed North West Elevation.



Fig.3 - Proposed South West Elevation.

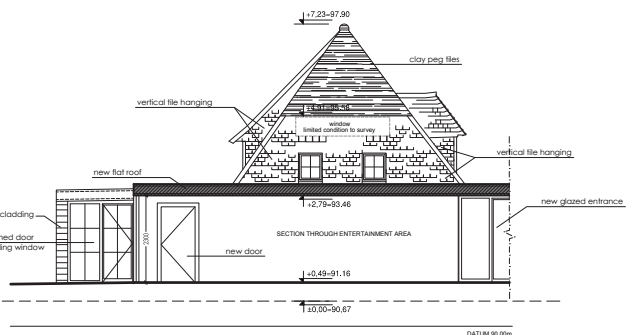


Fig.4 - Proposed South East Elevation.

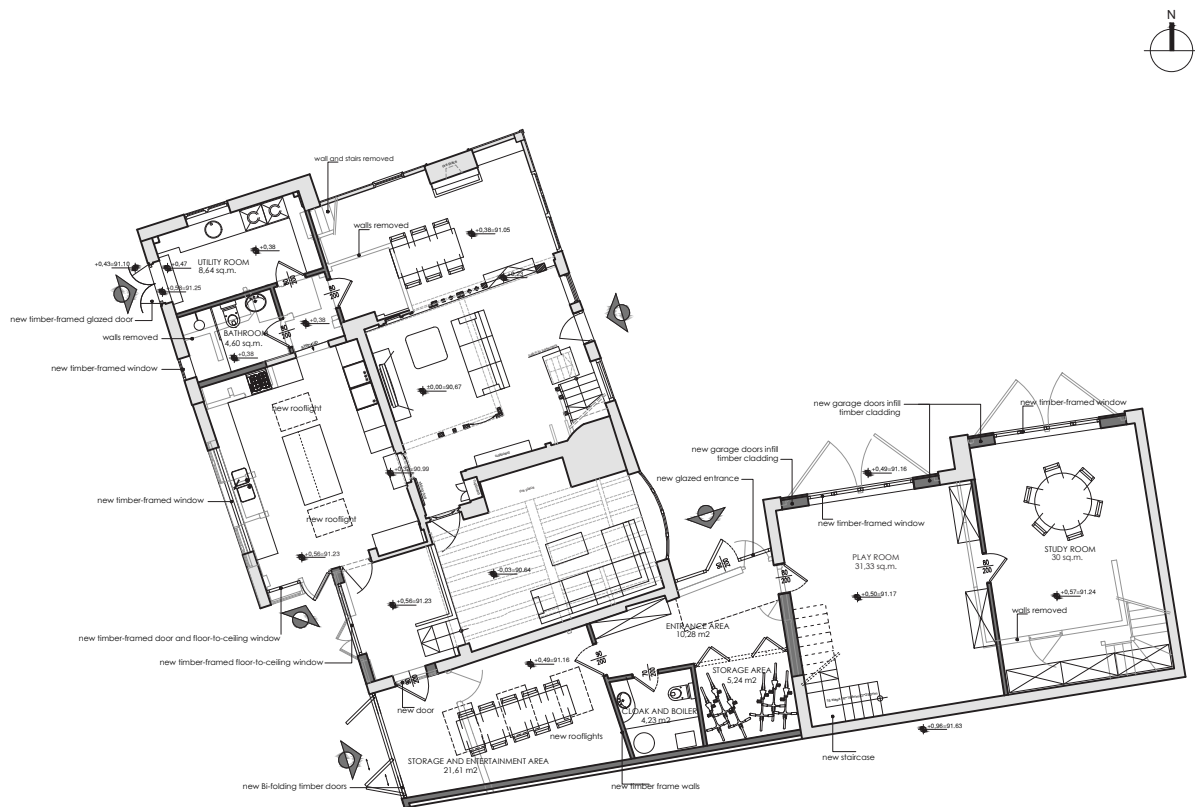


Fig.5 - Proposed Ground Floor Plan.

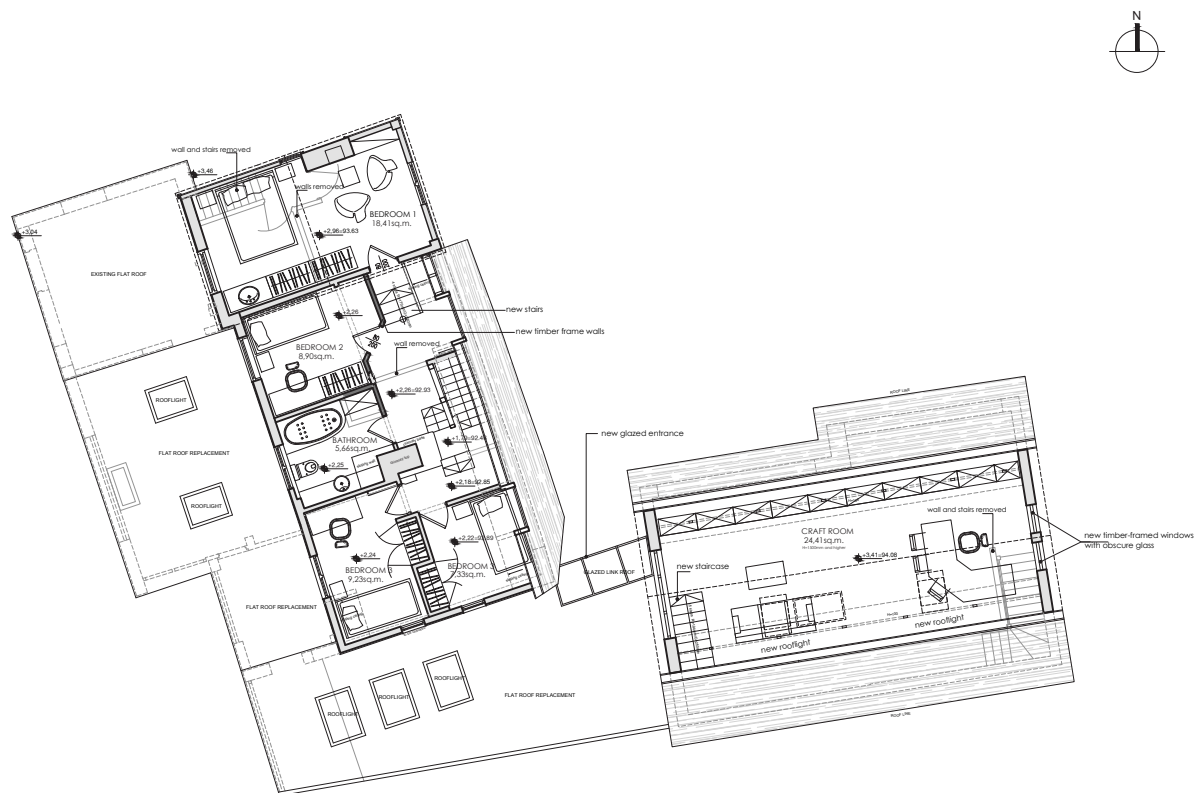


Fig.6 - Proposed First Floor Plan.

2. REPAIR METHODOLOGY

The repair methodology takes the following elements and documents into consideration:

- Building Survey of The Old Forge by Stuart Little (Chartered Building Surveyor).
- Asbestos Refurbishment Survey by KD Drainage and Asbestos Ltd.
- Design, Access & Heritage Statement.
- SPAB's technical advice notes.
- Historic England's technical conservation guidance.
- Site visits.

A regular maintenance schedule, such as the clearing of the gutters and drains, the fixing of slipped slates and tiles, should be arranged to maintain the health of the building, delay its decay and prolong the need of major interventions.

A repair should only be carried out when the problem(s) is identified and understood following careful investigation and monitoring. Where a full repair is not possible at a particular point, a temporary repair should be carried out instead to buy time for the building until a full repair is viable. Where a problem has no major effect on the use and structural integrity, it is best to be left alone.

The repair should aim to reduce the long-term deterioration of a building's fabric by remedying the cause of the defects, rather than to provide short-term solutions that the problems would be likely to return.

While deciding the approaches of the repair, the key factors for consideration are compatibility/suitability, context, cost, reversibility and longevity of the repair. The repair should be sensitive and relevant to the significance of the building fabric.

The majority of the Old Forge was constructed in traditional solid brick walls which need to breathe and allow any moisture absorbed by the building fabric to evaporate back out from the surface. Breathable structure, good ventilation and adequate heating were required to allow the building remain dry.

Various interventions have been carried out at the Old Forge historically such as the use of modern impervious materials i.e. cement mortar, impermeable paint and plaster etc, which prohibits the building to breathe as it should, prevents moisture to evaporate and increases the water content within the building structure, which have led to further problems such as the growth of moss/algae, mould, wood decay, water ingress etc. The defective lead flashings and weathering junctions have also contributed to the deterioration of the building.

The objective of the repair should aim to allow the building to breathe and stay dry again by carefully and selectively replacing the impervious materials with breathable ones, fixing defective weathering elements, while retaining the significance fabric and the character of the property.

The repair works should be done in phases. This allows one to observe and monitor the consequence of the repairs before applying them to the rest of the building.

3. EXTERNAL WORKS

3.1 External Brick Walls

The brick walls on the existing front (North East) elevation are of traditional solid wall construction, some bricks have paint residue over the exterior surface. The mortar appears to be cementitious, which forces the moisture to travel through the brickworks rather than the mortar which was supposed to be the sacrificial element.

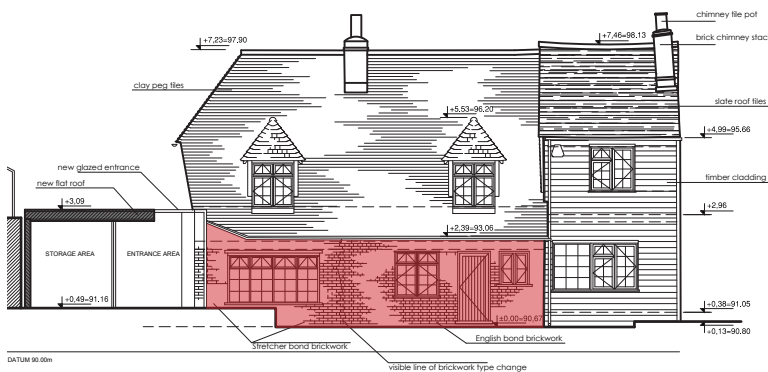


Fig. 7 - Proposed North East Elevation.

The bricks on the existing rear extension are in good conditions generally, apart from the bricks adjacent to the cladded wall on the South West elevation, which show sign of hygroscopic salts and erosion on some of the brick surface. This could be caused by the deterioration of the junctions between the two flat roofs which allow the ingress of rainwater, and/or the excessive amount of moisture within the solid wall behind the timber cladding transferring the moisture via capillary action.

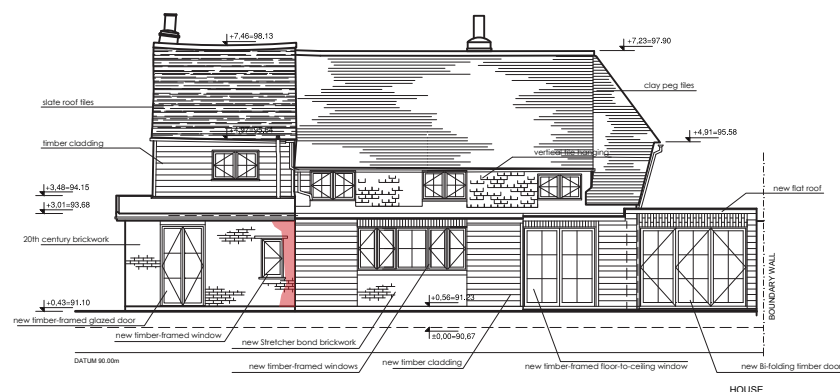


Fig. 8 - Proposed South West Elevation.

The bottom section of the brickworks also suffered from dampness due to the previously leaked drain pipe, which was then fixed temporarily. The drain pipe is to be removed and new soil vent pipe is to be installed to serve the ground floor shower room and bathroom above.

The severely damaged bricks should be cut out and replaced with new handmade soft bricks that match the existing ones as closely as possible in size, colour, texture, durability, and hardness. The less

eroded bricks should be carefully removed and where possible reversed to hide the decay. Where bricks are weathered but their condition could be determined as satisfactory, they should be left intact, and their condition carefully documented and monitored. In case there are bricks damaged while raking out the cement mortar, advice from the architect should be sought and decisions made accordingly.

The existing brickwork needs repointing. The existing mortar should be raked out to a depth at least twice the width of the joint; with the back of the cleared joint left as square as is practicable. To avoid damage to the bricks, the mortar should be raked out using appropriate hand tools – no powered tools such as a grinder may be used. All loose material from joints should be brushed away. The masonry must be thoroughly dampened with a hosepipe with a spray nozzle or a pump-action water sprayer, before placing the mortar. The mortar is to be 1:3 mix NHL 2.0 : sharp washed local sand. Water to be added to desired consistency. Pigments to be added, if necessary, in order to match colour of the historic brickwork joints. Work should start after a sample patch is considered acceptable by architects.

The mortar should be packed firmly into the joint using a pointing iron after all the loose material has been flushed out and the joint wetted first to reduce suction. The inside surfaces of the joint need to be damp but not wet. Joints need to be thoroughly filled from the back and compacted to avoid voids and be built up in layers of around 25mm deep. The joint should be filled slightly proud of the intended finished level to allow for slight shrinkage and compaction of the mortar as it firms up. Any mortar that is smeared on the masonry should be sponged off with clean water before it has dried. The joints should be finished by hitting the mortar with a bristle churn brush with a firm pushing action. It is important that the mortar is sufficiently set before this action otherwise the brush will leave a series of pinholes in the mortar.

Once the re-pointing is underway it must be protected to avoid damage or rapid drying. Ventilated covers (i.e. multiple layers of hessian) must be placed and regular mist spraying may be needed to maintain damp conditions as the mortar starts to set. Additional plastic sheeting or tarpaulins draped in front of the hessian covers may also be needed if it is very windy or there is driving rain.

Why are we not advising on using reclaimed bricks:

- i) salvaged bricks may be underfired and unsuitable for external work, or are sometimes damaged, stained or painted.
- ii) we don't know the overall properties and quality of the bricks, and especially having in mind the original soft bricks, the usage of much harder bricks will cause harm to the historic fabric.
- iii) Although new bricks should be easily distinguished after being placed, they will slowly weather and get the same appearance as the existing ones.

3.2 External Timber Frame Walls

The timber featheredge boarding is to be inspected for defects that may have arisen from beetle infestation, fungal attack or splits due to corroding nails. Any defective boards to be repaired or replaced with boards to match the existing in every detail. All weatherboards which are in good condition are to remain in place.

The existing frame is to be inspected for signs of rot and decay because of insect or moisture attack. Any structural timber members showing signs of decay are to be noted with repairs where

necessary. Any replacement timbers will be of the same timber species and scantling as the member being replaced. All existing material that is structural sound and in good condition will be retained.

Replace existing insulation between timber studs with vapour permeable and hygroscopic insulation such as sheep's wool insulation.

Install / replace breather membrane between the insulation and timber cladding. The breather membrane should be installed with some 'slack' behind the cladding so it is not held tight to its back face which will allow any water that penetrates the cladding to run freely away down the face of the membrane without being redirected against the timber cladding.

Clean and remove the algae, cobweb and dirt from the surface of the black timber cladding, follow by applying matt exterior paint on them to match the existing.

3.3 External Tile Hung Walls

The vertical tile hanging is in overall good condition. The existing timber battens supporting the vertical tile hanging are to be inspected for signs of rot and decay because of moisture attack or corroding nails. Any timber members showing signs of decay are to be replaced. All existing material that is structural sound and in good condition will be retained.



In some locations where the cementitious mortar bedding starts to deteriorate and enable water penetration, the cement mortar should be raked out carefully and replaced by lime mortar.

The lime mortar should be packed firmly into the gap between the tile hanging and substrate using a pointing iron after all the loose material has been flushed out and the tiles wetted first to reduce suction. The gap needs to be thoroughly filled and compacted to avoid voids. It should be filled slightly proud of the intended finished level to allow for slight shrinkage and compaction of the mortar as it firms up. Any mortar that is smeared on the tiles should be sponged off with clean water before it has dried.

Fig. 9 - Photo of the existing Old Forge.

Once the re-pointing is underway it must be protected to avoid damage or rapid drying. Ventilated covers (i.e. multiple layers of hessian) must be placed and regular mist spraying may be needed to maintain damp conditions as the mortar starts to set. Additional plastic sheeting or tarpaulins draped in front of the hessian covers may also be needed if it is very windy or there is driving rain.

3.4 Roofs

Clay tile and slate tile roofs

There is an excessive growth of moss on the roof tiles and under the ridge tiles which need to be cleansed and removed with brushes. The existence of the moss indicates dampness issues which may be caused by the lack of ventilation beneath the roof tiles. It is likely that some of the timber

batten behind the tiles are rotten, which should be carefully inspected with any rotten ones replaced. All new battens should be pre-treated against fungal attack. Battens to be fixed to the existing rafters with non-ferrous (e.g. stainless steel) ringed nails. Ensure the breather membrane is in good condition and draped properly, allowing air movement beneath the roof tiles. Replace the breather membrane if required. Install proprietary eave ventilator in strict accordance with the manufacturer's recommendation.

A visual inspection of the roof covering reveals that several tiles are broken, slipped or missing, if continue to neglect it will encourage the ingress of rainwater. Reinstatement and replace the chipped tiles with matching new tiles and resecure the slipped clay tiles. New tiles should match the type, colour, texture, size and thickness of existing ones. Avoid using second-hand plain tiles from other buildings.

Any cementitious torching and bedding to be removed carefully and replaced with lime mortar.

The timber roof structure is to be carefully examined for signs of rot and decay as a result of insect or moisture attack. Any rafters/ members that have shown signs of rot are to be noted and repairs made to. These members will either be repairs, doubled, or replaced depending on the percentage of the decay. Replacement members will be of the same timber species and scantling as the member being replaced. All existing material that is structural sound and in good condition will be retained.

Flat roofs

The existing felt flat roofs are degraded and are to be replaced with Single-ply roofing membrane system, detailed and installed in accordance with manufacturer's details and recommendations.

3.5 Chimneys

There are three existing chimneys within The Old Forge.

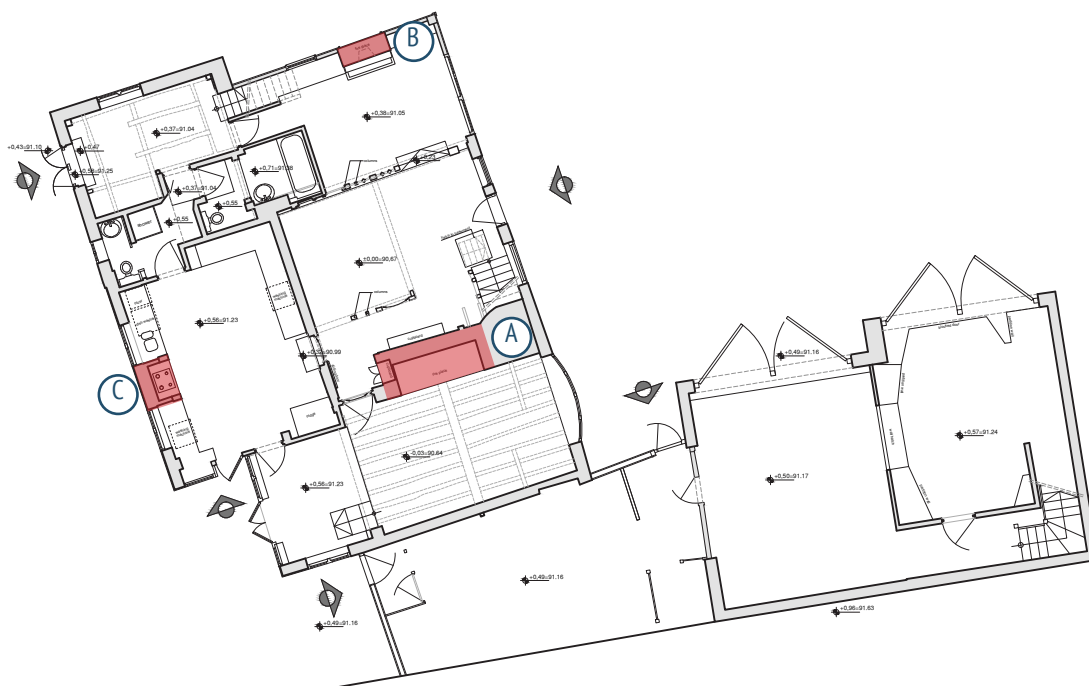


Fig. 10 - Existing Ground Floor Plan.

Chimney A



Fig. 11 - Photo of Chimney A.

Replace existing lead flashing with new ones, installed in strict accordance with Lead Sheet Training Academy's document 'Rolled Lead Sheet - The Complete Manual'.

The severely damaged bricks should be cut out and replaced with new handmade soft bricks that match the existing ones as closely as possible in size, colour, texture, durability, and hardness. The less eroded bricks should be carefully removed and where possible reversed to hide the decay. Where bricks are weathered but their condition could be determined as satisfactory, they should be left intact, and their condition carefully documented and monitored. In case there are bricks damaged while raking out the cement mortar, advice from the architect should be sought and decisions made accordingly.

The existing brickwork needs repointing in the same method that has been outlined for the external brick walls. Some of the deteriorated flaunching need replacing to shed the rainwater as original intended. Carefully remove the loose parts of the flaunching and brush away any dirt and loose materials. If the cement flaunching is too hard to remove, leave it as it is to avoid damaging the brickworks. Apply lime mortar carefully using a pointing trowel, scrape away any excess mortar and follow the profile of the existing flaunching. When the mortar is leather hard, smooth it over with a wood float.

It must then be protected to avoid rapid drying and shrinking. Ventilated covers (i.e. multiple layers of hessian) must be placed and regular mist spraying may be needed to maintain damp conditions as the mortar starts to set. Additional plastic sheeting or tarpaulins draped in front of the hessian covers may also be needed if it is very windy or there is driving rain.

Install a proprietary terracotta flue vent terminal to reduce water penetration. Carry out a level 2 chimney inspection and sweep by a NACS qualified chimney sweeper.

Chimney B



Fig. 12 - Photos of Chimney B.

Replace existing lead flashing and cracked cement mortar used around the abutment between the chimney and the slate roof tiles with new lead flashings, installed in strict accordance with Lead Sheet Training Academy's document 'Rolled Lead Sheet - The Complete Manual'.

The severely damaged bricks should be cut out and replaced with new handmade soft bricks that match the existing ones as closely as possible in size, colour, texture, durability, and hardness. The less eroded bricks should be carefully removed and where possible reversed to hide the decay. Where bricks are weathered but their condition could be determined as satisfactory, they should be left intact, and their condition carefully documented and monitored. In case there are bricks damaged while raking out the cement mortar, advice from the architect should be sought and decisions made accordingly.

The existing brickwork needs repointing in the same method that has been outlined for the external brick walls.

The deteriorated flaunching need replacing to shed the rainwater as original intended. Carefully remove the loose parts of the flaunching and brush away any dirt and loose materials. If the cement flaunching is too hard to remove, leave it as it is to avoid damaging the brickworks. Apply lime mortar carefully using a pointing trowel, scrape away any excess mortar and follow the profile of the existing flaunching. When the mortar is leather hard, smooth it over with a wood float.

It must then be protected to avoid rapid drying and shrinking. Ventilated covers (i.e. multiple layers of hessian) must be placed and regular mist spraying may be needed to maintain damp conditions as the mortar starts to set. Additional plastic sheeting or tarpaulins draped in front of the hessian covers may also be needed if it is very windy or there is driving rain.

Install a proprietary terracotta flue vent terminal to reduce water penetration. Carry out a level 2 chimney inspection and sweep by a NACS qualified chimney sweeper.

Install air bricks to provide ventilation to the chimney if not being used.

Chimney C

To be demolished as per the approved planning drawings.

3.6 Windows and Doors

All external modern windows, doors and lead flashings are to be replaced. While all of the existing windows / doors are in poor conditions where some are rotten, none of them are the originals or have any significant heritage values. They are detrimental to the character of the house. The new windows and doors should aim to improve the thermal comfort, provide adequate background ventilation, while not to harm the character of the historic property.

Note: A separate householder and listed building consent application is to be submitted to seek approval to replace windows / doors that have yet to received consents.

4. INTERNAL WORKS

4.1 Internal Side of the External Walls / Underside of Ceilings

General

The Asbestos Refurbishment Survey identified the existence of asbestos concealed behind interior paints on the internal side of some of the external walls and underside of the ceilings. The majority of the asbestos found are chrysotile and have a score range of 4 / 5 - which are low risk and have low potential to release fibres if disturbed. The report recommended to remove the asbestos.

As set out in the repair methodology section, one of the main goals of the repair is to enable the walls to breathe again and allow excessive moisture to escape from the building. The existing impervious internal wall plaster and paint should be carefully removed and replaced with lime plaster and breathable paints.

The building owners would also want to improve the energy efficiency of the historic building for the benefits listed below:

- Lower carbon emissions and fuel bills.
- Increase thermal comfort.

A balance should be struck that the characters and appearance of the Listed Building and Hook Green Conservation Area would be protected and maintained, while the thermal efficiency of the building fabric is being upgraded. It is crucial to avoid unintended consequences such as moisture accumulation, overheating, worsen indoor air quality and fabric damage.

Taking the above into consideration, it is proposed to -

- Carefully remove asbestos by experienced specialists.
- Carefully remove impermeable internal plaster and wall paint.
- Install wood-fibre tongue and groove insulation board internally to external walls.
- Apply lime plaster finished (or lath and lime plaster at ceilings) with breathable paint.

Characteristic building feature such as the original timber frames should not be covered and will remain exposed.

Note: In the Design, Access & Heritage Statement accompanying the original permitted planning applications (ref: 20200654 & 20200655), it was proposed to paint interior walls with breathable linseed oil paints or using limewash. However, the installation of internal insulations and removal of asbestos were not part of the original planning applications, therefore, a separate listed building consent application should be submitted to seek approval from the local planning authority.

4.2 Pitched Roof Insulations

Insulation at ceiling level (Loft insulation)



Fig. 13 - Photo of the loft space above the proposed bedroom 1.

The condition of the existing wool insulation should be examined of any signs of dampness, deterioration and life forms. Replace with new sheeps wool insulation if required.

Install insulation between the ceiling joists and extra layers of insulation above and perpendicular to the joists. The overall thickness of the insulation should be approximately 300mm.

The sheeps wool insulation should be fitted tightly between the ceiling joists to avoid gaps and cold bridges. Seal cracks and gaps around services to prevent infiltration of moist air from below.

The insulation should lap over the head of the external walls at the eave junction, or have an upstand of approximately 225mm above the top of loft insulation against the gable walls to minimise thermal bridgings. Maintain eaves ventilation by placing proprietary spacer to provide 25mm minimum ventilation gap at eaves.

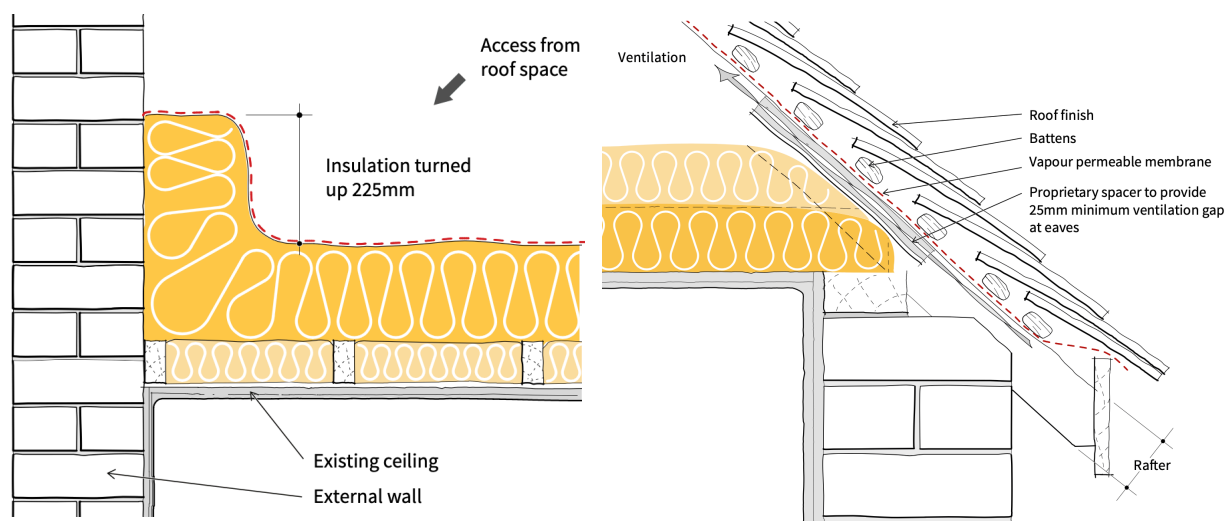


Fig. 14, 15 - Images from Historic England's guidance 'Energy Efficiency and Historic Buildings - Insulating Pitched Roofs at Ceiling Level'.

Separate the insulation from damp chimneys and walls by using vapour permeable building papers.

Insulation at rafter level



Fig. 16 - Photo of the loft space under the main clay tile roof.

Under the main clay tile roof, the loft space is being used as a storage and place to accommodate the water tanks/cylinders. The insulation is installed at the rafter level.

Replace the existing insulation between the rafters with sheep's wool insulation such as Thermafleece and install an extra layer of wood-fibre tongue and groove insulation board below the rafters, following by applying breathable lime plasters.

Ensure the gaps between the rafters and the insulation are kept to a minimum as the gaps can result in air infiltration. A 25mm gap will be left between the top of the insulation and the top of rafters which will allow the breather membrane to drape between the rafters.

Note: The installation of roof insulations were not part of the original planning applications. A separate listed building consent application should be submitted to seek approval from the local planning authority.

Why is Historic England not advising on using vapour barriers, as quoted from their guidance 'Insulating Pitched Roofs at Rafter Level':

Whilst the installations of vapour barriers to control condensation within insulation and associated structures is theoretically effective, it is in reality very difficult to install them in historic buildings -

i) Where the insulated roof slope abuts permeable construction, the vapour barrier will be easily by-passed causing increased condensation and potential damage.

ii) Where there is a risk the vapour barrier may be punctured in use. Where punctures occur, condensation and consequent damage will normally occur within the historic construction this exposes.

4.3 Ground Floor

The existing ground floor to the proposed Utility area is of concrete construction, which shows

signs of dampness and has damaged the bottom of the walls in the area. A damp proof membrane is to be installed above the existing concrete slab before laying the underfloor heating system and new flooring. The moisture can be driven into the walls, hence, it is important to have the floor's damp proof membrane and wall's damp proof course lapping over each other.



Fig. 17 - Photos of the existing cellar.

The underfloor heating system and new floor tiles are also to be installed to the proposed kitchen and garden room.

4.4 Cellar

Remove cement plaster and other late finishes from the walls and ceiling and replace with lime plaster (or lath and lime plaster at the ceiling) and limewash finish.



Fig. 18 - Photos of the existing cellar.

4.5 Staircases and Landings



Fig. 19 - Photos of the existing stairs.

The existing staircases do not have rigid / safe guarding, which creates hazards for the habitants and visitors. Young and elder people are especially vulnerable to the existing arrangement. New guardings such as a very simple slimline back steel balustrades with railings are to be installing to the staircases and landing.

5. SERVICES

5.1 Heating / Hot Water System

The heating and hot water system, including a new boiler is to be designed and installed by heating and plumbing specialist. All work to be designed and carried out in accordance with the Domestic Heating Compliance Guide.

5.2 Electrical

The house is to be rewired by a specialist electrician who is experienced in working with historic assets and respect the historic character and fabric. All wiring and electrical work to be designed, installed, inspected and tested in accordance with the requirements of BS7671, the IEE 16th Edition Wiring Guidance and the Building Regulations Part P (Electrical Safety) by a person who is a member of the Competent Persons Scheme authorised by the Secretary of State.



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