

Hutton + Rostron Environmental Investigations Limited

Grandpont House, Oxford: Roof finishes investigation

Site note 2 for December 2023-January 2024, job no. 160-42

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1 INTRODUCTION

1.1 AUTHORITY AND REFERENCES

Hutton + Rostron Environmental Investigations Limited carried out site visits to Grandpont House, Abingdon Road, Oxford during December 2023-January 2024 in accordance with instructions from Xavier Bosch by email on 15 January 2024. Drawings provided by Studio Stassano were used for the identification of structures. For the purpose of orientation in this report, the building was taken as facing west onto Abingdon Road

1.2 AIM

The aim of this survey was to investigate roof finishes (i.e. slates, flat roof coatings and flashings) for construction, condition and viability for refurbishment. Recommendations are provided for remedial works as part of the proposed refurbishment scheme

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 materials 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

2 STAFF ON SITE AND CONTACTS

2.1 H+R STAFF ON SITE

Tim Jordan
Ellen Wise

2.2 PERSONNEL CONTACTED

Mr Xavier Bosch
House residents

3 OBSERVATIONS AND RECOMMENDATIONS

3.1 EXECUTIVE SUMMARY

As described within attachments, roof finishes were a mixture of types, ages and condition. The main house has been re-finished circa 1980s in a fairly poor quality Spanish slate. The stables has be re-laid at this time using salvaged Penrhyn slate which may be nearing the end of its service life. Detailing for underlayment, insulation and ventilation was deemed to be poor and hampering performance of the building. Lead dressings dated from the 1980s works; these suffered various defects and substandard detailing

Recommendations are detailed within attachments. H+R recommend total replacement of the roof finishes and detailing for performance upgrades as part of the upcoming refurbishment scheme

4 H+R WORK ON SITE

- 4.1** H+R inspected specified parts of the building fabric using all available access and exposure
- 4.2** H+R deployed visual, tactile and specialist equipment techniques to interrogate the fabric

5 PROPOSED ACTION BY H+R

- 5.1** H+R will advise on repair and conservation, so as to minimise the risk of decay after refurbishment if instructed
- 5.2** H+R will advise on remedial detailing, so as to minimise the risk of damp and decay problems after refurbishment if instructed
- 5.3** H+R will advise on conservation of original fabric with regard to damp, decay and salt damage, as necessary and if instructed
- 5.4** H+R will review proposed remedial details as these become available if instructed
- 5.5** H+R will return to site to inspect sample remedial details if instructed
- 5.6** H+R will liaise with conservation and historic building authorities, if instructed, so as to ensure the cost-effective conservation of original fabric

6 INFORMATION REQUIRED BY H+R

- 6.1** H+R require up-to-date copies of project programmes, as these become available
- 6.2** H+R require copies of up-to-date lists of project personnel and contact lists as these become available
- 6.3** H+R require copies of proposed remedial details for comment as these become available
- 6.4** H+R should be informed as a matter of urgency if further significant water penetration occurs onto site; so that advice can be given on cost-effective remedial measures, to minimise the risk of cost or programme overruns and so as to minimise the risk of damp or decay problems during the latent defect period

7 ADMINISTRATION REQUIREMENTS

- 7.1** H+R require formal instructions for further investigations and consultancy on this project
- 7.2** H+R require confirmation of distribution of digital and printed copies of reports and site notes

Attachment A

SCHEDULE OF OBSERVATIONS AND RECOMMENDATIONS

REFERENCE	ITEM	OBSERVATIONS	RECOMMENDATIONS	CLIENT COMMENTS
SN2.1 MAIN HOUSE, MAIN ROOF, FINISHES				
SN2.1.1	Main House Main roof Construction	<p>Supporting structure: Softwood rafters, only half of which retained their original sarking boards</p> <p>Slates: Blue-grey (Spanish?) slates each measuring 500x250x5mm with exposed margin of 230mm. Slates expected to date from late 1980s refurbishment scheme. Slates were of a poor quality grade due to contamination with pyrite minerals (which corrode over time, leading to staining and breakage). It was suspected that surviving parts of the previous roof finish (Penrhyn slate) have been re-laid onto the Stables</p> <p>Leadwork: All leadwork was measured to be of code 4 in lengths of upto 2200mm. The hips and ridge flashings showed fairly crude screws as additional fixings/restraint. The timber formwork of the parapet gutter has been significantly altered during the 1980s scheme to change the direction of falls (this was done by overlaying the previous formwork which remained ~250mm below). Joints in gutter linings were welted rather than stepped; this is against good practice (but seems to have been done due to constrained parapet height which did not allow for traditional weir steps)</p> <p>Detailing: Slates have been laid onto bituminous underlay '1F felt'. This was fairly impervious to moisture vapour movement and there were no air gaps to allow through-ventilation (raising the risk of condensation and beetle activity). Only one of the five top floor ceilings had been laid with insulation (mineral quilt); warm humid air would tend to rise from the interiors and condense within the roof with deleterious effects</p> <p>Access: A ceiling hatch within the second floor north-west bedroom originally led to external roof hatches to facilitate maintenance. A water storage tank has since obstructed access to these external hatches. A substitute external access by vertical ladder (crudely fixed into the west elevation by drywall screws) seemed very dangerous. The minimum parapet height above the gutter was 170mm which offered no edge-protection to a person traversing the roof</p>	<p><i>Missing sarking boards with penny gaps should be reinstated</i></p> <p><i>H+R recommend the existing slates should be discarded and replaced with new Penrhyn slate with copper nail fixings into new battens</i></p> <p><i>H+R recommend all leadwork should be discarded (salvage value recoverable) and replaced in new leadwork. All gutter formwork should be replaced to achieve suitable falls and movement joints. Within the constraints of what improvement can be made to formwork, the leadworker should select an appropriate lead code thickness to tolerate movement stress in given sheet sizes. Detailing of leadwork and gutter formwork will also depend on what form the future drainage strategy/layout will take</i></p> <p><i>A bat-friendly breather membrane should be laid over counter-battens upon sarking boards. Linear vent strips such as those from Nicholson Airtrack should be provided along all roof edges (ridges, layboards and parapets)</i></p> <p><i>H+R recommend that the original route to the exterior is reinstated as a means of undertaking maintenance (such as routine gutter clearance). A latchway system can be considered so as to provide harness securement</i></p>	
SN2.1.2	Main House Main roof Condition	<p>Beyond the constructional flaws noted above, there were various material damage issues noted during the survey</p> <p>As shown in photographs, pyrite staining and damage has developed in slates and could be expected to worsen in future (if these slates were to be retained). There were at least 12no. slates previously re-supported by tingles and at least 2no. broken slates</p> <p>There were at least 12no. patches to the lead gutter linings where holes/splits have developed in the past. Splits in the ridge flashings have been patched previously</p> <p>It was notable that the majority of water ingress problems over the building's lifetime have been related to roof drainage overflow (vulnerable detailing related to internal water trough which can overflow into the building if outlets become blocked with debris). Roof <u>drainage</u> should be appreciated as a separate matter to roof <u>finishes</u> (drainage systems of this type demand routine maintenance/upkeep)</p>	<p><i>Total replacement of roof finishes and build-up have been recommended (see above)</i></p> <p><i>Total replacement of roof finishes and build-up have been recommended (see above)</i></p> <p><i>Total replacement of roof finishes and build-up have been recommended (see above)</i></p> <p><i>Refer to H+R Site Note 3, relating to roof drainage</i></p>	

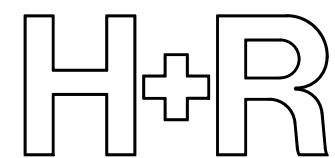
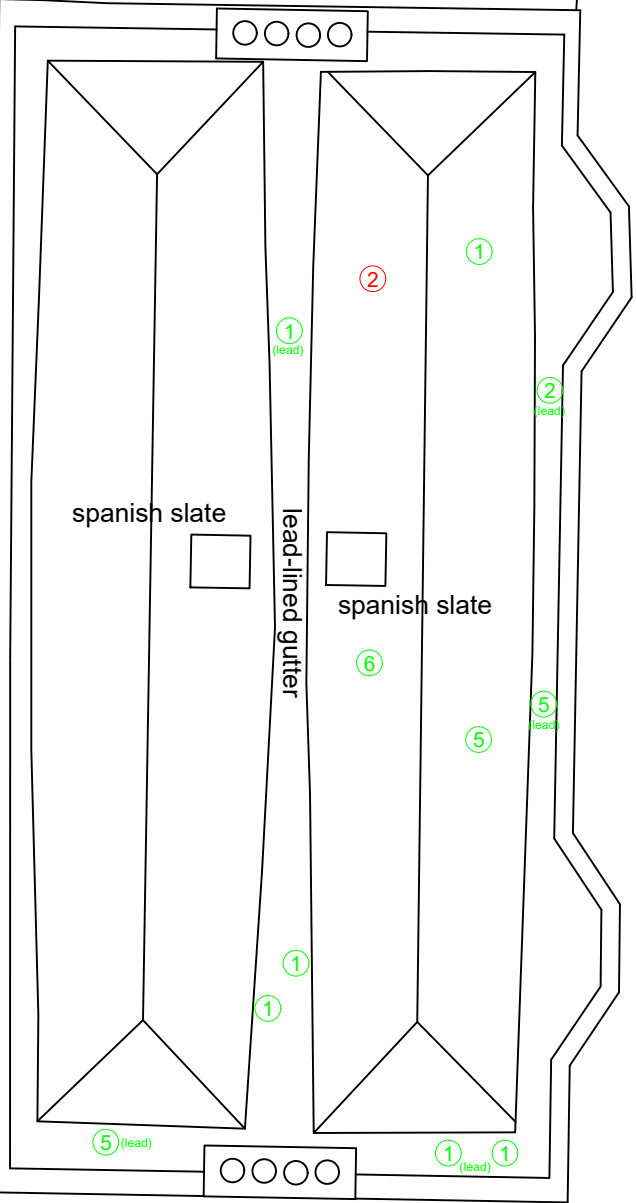
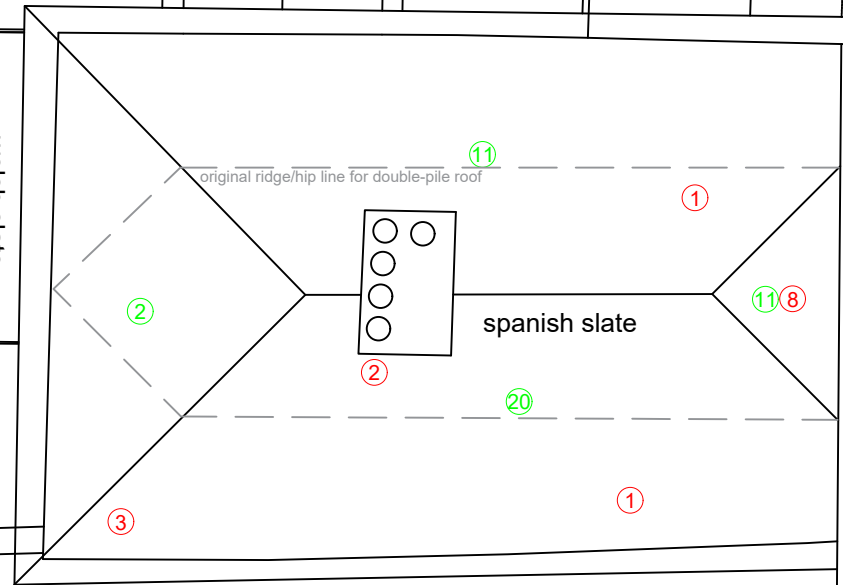
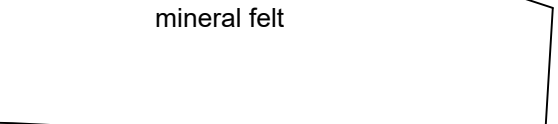
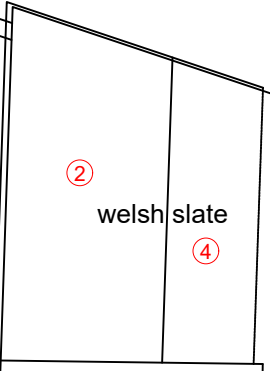
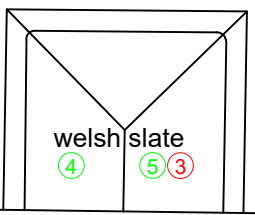
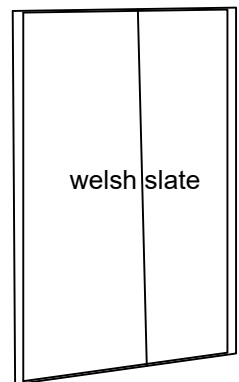
REFERENCE	ITEM	OBSERVATIONS	RECOMMENDATIONS	CLIENT COMMENTS
SN2.2 MAIN HOUSE, SECONDARY ROOFS, FINISHES				
SN2.2.1	Main House Secondary roofs West wing	<p>This roof has been much altered from 'double-pile' format to a single pitched roof (by adding rafters and sarking to infill the original central valley gutter). There may also have originally been a parapet wallhead detail (since replaced with a sproketed eaves detail). This alteration was suspected to have been carried out circa 1900-1910 and a fibrous matting underlay remained from this period</p> <p>Slating was as for the main roof (poor quality Spanish slate). As shown on drawings, there were at least 31no. re-supported/patched slates and at least 14no. broken slates. Nail fixings were of galvanized steel with 7mm heads. Patching/repair to slates was often very crude (e.g. use of flashband)</p> <p>Hips and ridges were dressed with angular 'staffordshire blue' clay ridge tiles. Each tile measured 450x180x15mm and was laid onto a mortar bed with very tight joints. Mortar was becoming loosened</p> <p>A mix of code 4 and 5 lead was used in dressings (back-gutter and chimney flashings)</p> <p>A metal snow guard was fitted along the south eaves (perhaps also intended to catch falling slates). The guard was damaged at the south-east corner (where it may be especially relied upon to avoid slates falling above the entrance doorway below)</p>	<p><i>The Architect may consider if there is any merit in reinstating the original roof design (double-pile with parapets). This would have an impact upon the approach to roof finishes</i></p> <p><i>Total replacement of roof finishes using Penrhyn slate with lead dressing along with upgrading of build-up detailing is recommended (as per main roof)</i></p> <p><i>Clay ridge tiles may be feasible to lift and re-lay (although it should be noted that they are not an original feature). Even if the original roof shape is not restored, it might still be more historically faithful to use a lead flashed ridge detail (versus a mortared tile)</i></p> <p><i>Total replacement of roof finishes and build-up is recommended (as per main roof)</i></p> <p><i>It is not necessarily an essential requirement to fit snow guards on eaves overhangs. The Architect can review this</i></p>	
SN2.2.2	Main House Secondary roofs North side	<p>A fairly long and thin flat roof (along the north side of the main building) for a single story extension dated from circa 1930s. This was finished in mineral felt with a gravel layer providing UV protection. The finish appeared watertight but was unlikely to have a reliable further service life</p> <p>The pitched roof (room at west end of the flat roof described above) was finished in slate. There were at least 6no. broken slates</p> <p>The hipped roof (single story room at north side of west wing). The rafter structure was clad in softwood sarking boards and finished in Welsh grey slate (Cwt-y-bugail). There were at least 3no. broken slates and 9no. patched slates</p> <p>The lean-to roof (single story room at west end of west wing) was finished in a mix of grey and heather Welsh slate. There were at least 10 no. broken/slipped slates and at least 8no. previous patch repairs (tingles). For such as small roof, the proportion of failure was very high</p> <p>The single story shed/store (standing independently beyond the west end of the west wing) was also finished in a mix of grey and heather Welsh slate. The mix indicated that a variety of salvaged materials had been used to compose this finish. The ridge tiles were in blue clay (as per west wing). There were estimated to be ~10no broken/slipped slates and ~20no. patched slates. Quality of patching/repair was often deemed to be poor</p>	<p><i>Allow to renew the flat roof finish in new materials. On the suspicion that there may be little/no insulation, allow to add insulation between and under flat roof joists (leaving at least 50mm clear air gap at the underside of the roof decking and providing linear vent strips around the entire perimeter)</i></p> <p><i>Total replacement of roof finishes using Penrhyn slate with lead dressing along with upgrading of build-up detailing is recommended (as per main roof)</i></p> <p><i>Total replacement of roof finishes using Penrhyn slate with lead dressing along with upgrading of build-up detailing is recommended (as per main roof)</i></p> <p><i>Total replacement of roof finishes using Penrhyn slate with lead dressing along with upgrading of build-up detailing is recommended (as per main roof)</i></p> <p><i>Total replacement of roof finishes using Penrhyn slate with lead dressing along with upgrading of build-up detailing is recommended (as per main roof). Note that insulation and ventilation detailing would depend on whether this shed/store might be brought into use for habitation</i></p>	

REFERENCE	ITEM	OBSERVATIONS	RECOMMENDATIONS	CLIENT COMMENTS
SN2.3 STABLES ROOF FINISHES				
SN2.3.1	Stables Roof finish Construction	<p>Softwood roof structure of rafters had been overlaid with a bituminous '1F' roofing felt, softwood battens and Penrhyn slate. These slates were suspected to have been salvaged from the Main House; they may therefore be 100 years old or more. Given that Welsh slate is normally assumed to have a service life of upto 150 years, the integrity of these slates would be questionable (if they were to be retained for some further decades)</p> <p>Ridge tiles appeared to be angular concrete units</p> <p>At the centre of the south eaves, a narrow flat roof was provided behind a run of parapet wall. This had been finished in mineral felt. This created an awkward drainage detail as water ran-off the edge of the flat roof and overloaded the adjoining sections of eaves gutter</p> <p>The 'Cottage' wing at the east end of the stables has been purposefully ruined by removal of the roof several decades ago. The reasoning behind this was unclear to H+R</p> <p>The lean-to storage shed at the east side of the cottage was finished in poor quality corrugated plastic. There were various other residues of slate roofs alongside this, one of which has been demolished</p> <p>A lead-lined back gutter was assumed to have been provided at the west hip abutment with the stone boundary wall. This was largely unseen due to overgrowth/debris overlying</p>	<p><i>Total replacement of roof finishes using Penrhyn slate with lead dressing along with upgrading of build-up detailing is recommended (as per main roof)</i></p> <p><i>A lead flashed hip/ridge detail is felt to be a more appropriate detail (versus tile)</i></p> <p><i>Allow to renew this section of flat roof finish. Flashings/bunds should be created to disperse water more evenly towards drainage outlets</i></p> <p><i>Presumably the 'Cottage' will be rehabilitated as part of the upcoming scheme; a new roof finish will be required (Penrhyn slate is suggested, as for remainder of site)</i></p> <p><i>The Architect may consider how the various storage sheds, lean-to's etc. found between the Main House and Stables might be rationalised within the upcoming scheme. They might either be demolished or rehabilitated</i></p> <p><i>Allow to renew the lead gutter lining. Also allow to review and make good any defects in the stone boundary wall and coping (due to the risk of water penetration through the stonework which might bypass the gutter and affect the interiors)</i></p>	
SN2.3.2	Stables Roof finish Condition	<p>At the south pitch, there were at least 9no. broken/slipped slates and 10no. patched slates. In the north pitch, a large proportion of the eaves course seems to be slipping out of position</p> <p>None of the eaves overhangs seemed to have been properly set-out (they often barely projected enough to shed water into the gutter). The roof did not appear to include adequate detailing for insulation or ventilation. The 1F felt underlay did not allow for moisture vapour diffusion</p>	<p><i>Total replacement of roof finishes using Penrhyn slate with lead dressing along with upgrading of build-up detailing is recommended (as per main roof)</i></p> <p><i>New and improved detailing for eaves overhangs will be required. This can be undertaken in conjunction with new detailing for insulation, ventilation and underlayment. For example, linear vent strips along a shadow gap above a new fascia board</i></p>	

Attachment B



see stables drawing...

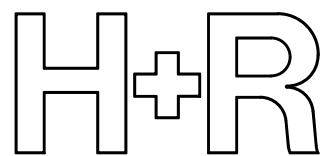
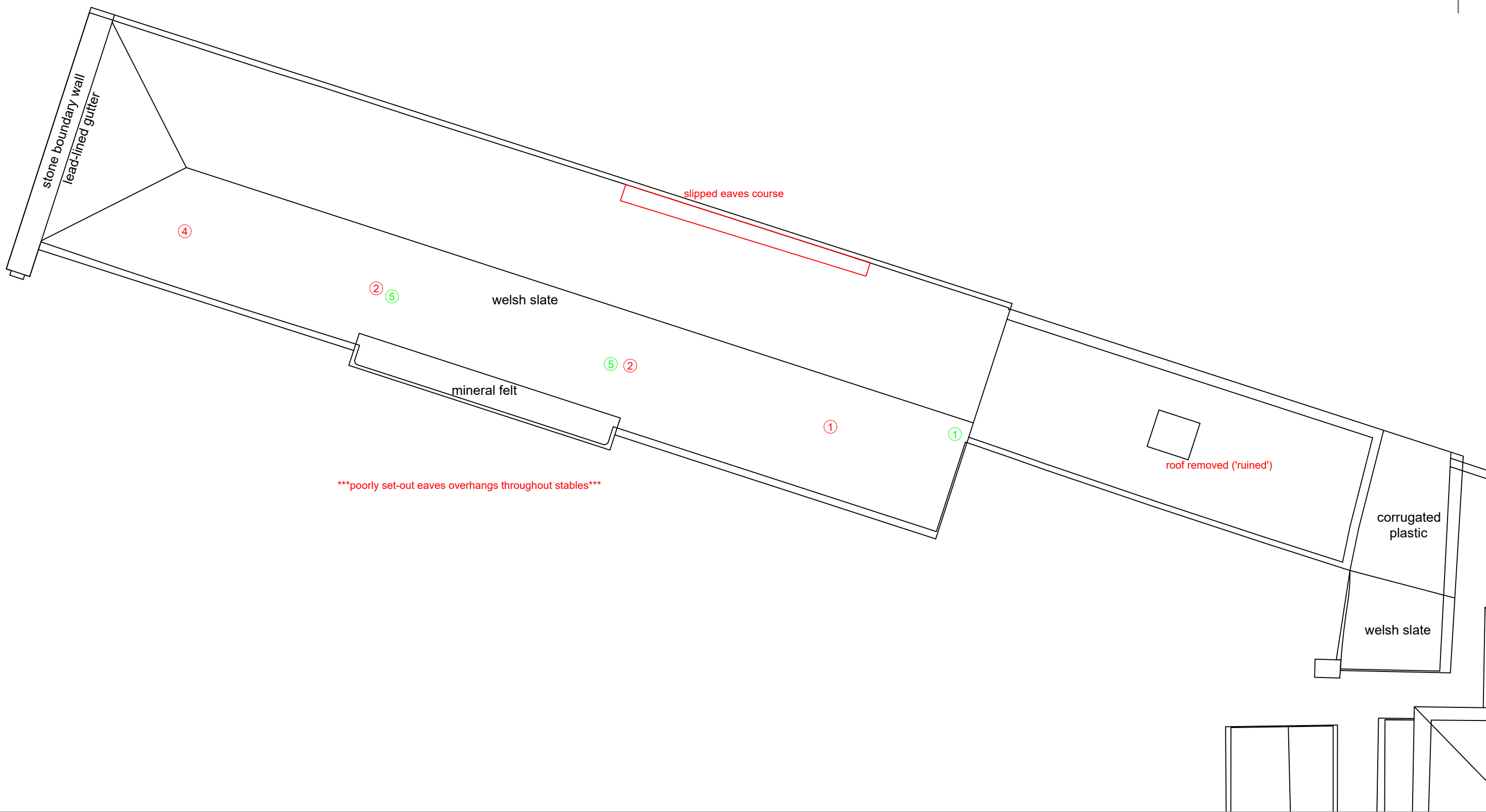


Grandpont House, Main House - Roof
Roof finishes investigation
December 2023 - January 2024

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Netley House, Gomshall, Surrey, GU5 9QA Tel: 01483 203221
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Key:

- ⑤ Damaged slate (quantum)
- ⑤ Repaired slate/lead (quantum)



Grandpont House, Stables - Roof
Roof finishes investigation
December 2023 - January 2024

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Key:

- ③ Damaged slate (quantum)
- ⑤ Repaired slate/lead (quantum)

Attachment C



Fig 1:

Main House

Main roof; showing general view with north orientated at head of image



Fig 2:

Main House

Main roof; showing west pitch and parapet gutter



Grandpont House

Photographs

December 2023-January 2024

Not to scale

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Fig 3:

Main House

Main roof; showing measurement of lead flashing upon parapet wallhead



Fig 4:

Main House

Main roof; showing central valley

Note external roof hatches



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 5:

Main House

Main roof; showing central valley and drainage catchpit leading to interiors



Fig 6:

Main House

Main roof; showing wetted joints in gutter lining

Note standing water due to lack of falls



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 7:

Main House

Main roof; showing east pitch, east gutter and bay windows

Note previous patch repairs to damage in gutter/bay leadwork

Note purple staining at ridge which H+R commonly observe where atmospheric pollution levels have dropped



Fig 8:

Main House

Main roof; showing various repairs to ridge flashing

Note flashband patches and plastic screw fixings



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 9:

Main House

Main roof; showing corroding pyrite inclusions within Spanish slate

Note slate repaired by nailing directly through (against good practice)



Fig 10:

Main House

Main roof; showing failed slate repair (cracked had been taped-together)



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 11:

Main House

Main roof; showing flashband patches to stress splits in parapet gutter

Note there are lacking movement joints due to wetting detail



Fig 12:

Main House

Main roof; showing constrained parapet height which limited proper step detailing in gutter lining



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 13:

Main House

Main roof, west side; showing bituminous underlay seen within roof void



Fig 14:

Main House

Main roof, west side; showing sarking boards (which are not present in all pitches)



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 15:

Main House

Main roof; showing previously over-laid gutter formwork



Fig 16:

Main House

Main roof, east side; showing sarking boards (which are not present in all pitches)



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 17:

Main House

Main roof, east side; showing internal drainage trough which has been decommissioned in the past

Note large bees nest present in this area



Fig 18:

Main House

West wing; showing general view

Note various patch repairs to slates using flashband



Grandpont House

Photographs

December 2023-January 2024

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Fig 19:

Main House

West wing; showing north pitch



Fig 20:

Main House

West wing; showing south pitch

Note various slipped slates resting in gutter/snowguard above entrance walkway (risk of injury to persons by falling material!)



Grandpont House

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December 2023-January 2024

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Fig 21:

Main House

West wing; showing sample exposure
of slate build-up



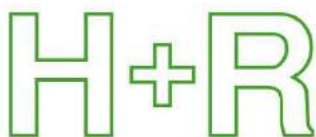
Fig 22:

Main House

West wing; showing sample exposure
of slate build-up

Note fibrous matting underlay

Note re-holed slates



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 23:

Main House

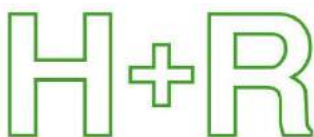
West wing; showing alteration to internal structure (central valley infilled)



Fig 24:

Main House

West wing; showing underside of sarking boards (penny gaps offer view of fibrous matting below slates)



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 25:

Main House

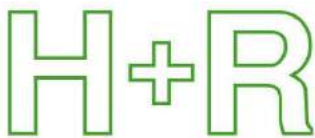
Secondary roofs along north side;
showing mineral felt flat roof



Fig 26:

Main House

Secondary roofs along north side;
showing mineral felt flat roof and small
slated pitched roofs



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 27:

Main House

Secondary roofs along north side;
showing mineral felt flat roof

Note gravel protection layer with
accumulation of moss/debris



Fig 28:

Main House

Secondary roofs along north side;
showing grey slates with localised
breakage



Grandpont House

Photographs

December 2023-January 2024

Not to scale

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Fig 29:

Main House

Secondary roofs along north side;
showing restricted view of 1F felt
underlay



Fig 30:

Main House

Secondary roofs along north side;
showing damaged slating



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 31:

Main House

Secondary roofs along west side;
showing various slipped and repaired
slates



Fig 32:

Stables; showing general view

North orientated at head of image



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 33:

Stables

North pitch; showing west end



Fig 34:

Stables

North pitch; showing east end

Note large area of slipped eaves course



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 35:

Stables

South pitch; showing east end

Not small flat roof behind central
parapet

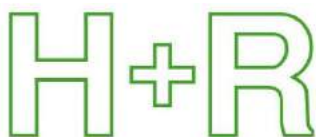


Fig 36:

Stables

South pitch; showing west end

Note back-gutter at boundary wall
abutment



Grandpont House
Photographs
December 2023-January 2024
Not to scale



Fig 37:

Stables

South pitch; showing lacking eaves overhang projection (causing water to 'miss' the gutter)



Fig 38:

Stables

The 'Cottage'; showing purposeful removal of roof carried out in the past



Grandpont House
Photographs
December 2023-January 2024
Not to scale