

Heritage Statement and Impact Assessment for Render Repair
Proposals at:

West Front Facade, Highclere Castle



Planning Issue - September 2023

Produced in September 2023 for:

Highclere Castle Estate

Written by:

Stephen Pitt-Francis ARB RIBA AABC
Brownhill Hayward Brown Architects, Georgian House, 24 Bird Street, Lichfield, Staffs, WS13 6PT
01543 254357

Cover Images:

Fig. 1 (overleaf) Highclere Castle, viewed from the West, May 2023.

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NOTE:

This Heritage Statement should be read in conjunction with all the submitted planning application documentation.

Project Background and Scope

Highclere Castle itself is a grade 1 listed structure which requires little introduction. The Castle was first built in 1679 but renovated in the 1840s to what we see today. Its striking principal elevations face North, East and South with central tower and corner turrets. The principal elevations and tower are built in ashlar Bath stone masonry, quarried 60 miles West of the Castle.

However the West facade of Highclere Castle is mostly made of rendered masonry. It was part of the works undertaken during the 1840s. Today the render is cracking and crumbling in a number of areas and a risk is presented by this ongoing weathering damage to both the original render and the later patch repairs. This project intends to address the failing render with appropriate proposed repairs.

The construction proposals can be understood in conjunction with all the drawings and documents provided with the listed building consent submission. The proposals favour sustainable construction methods wherever possible.

Document Purpose

Consequently in support of the intended project scope this document responds to section 189 of the National Planning Policy Framework:

189. In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

This Heritage Statement will convey the research made into the HER that has allowed an understanding to be formed by the design team. Within this statement the Heritage Impact Assessment will also structure and assess the impact of works in a relevant targeted manner. It will anticipatively identify if there are any elements of the proposals that may require further collaborative pre-commencement design work through discharge conditions (designated by the local planning/conservation officers).

This document extends HER research and understanding of the asset into covering any topics that are considered relevant to the new proposals. It then evaluates the proposals by targeting specific matters for assessment of impact, mitigation with justification.

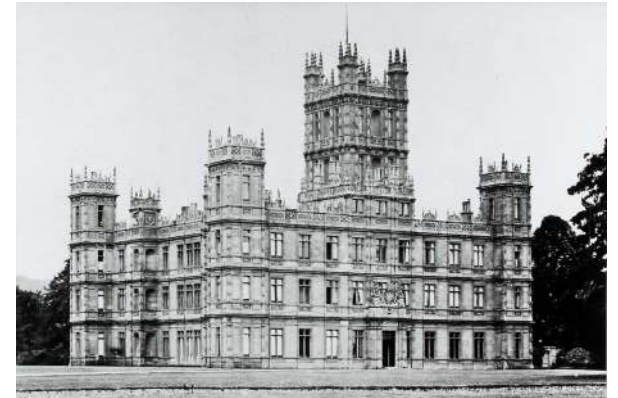


Fig. 2 (above) Highclere Castle's stonework South Front and East Front viewed from the southeast. (Copyright Historic England Archive_1704_001, All Rights Reserved)

Fig. 3 (below) Highclere Castle's rendered West Front and stonework South Front and towers, viewed from the southwest (BHB Architects 2023)



Heritage Asset Listing Descriptions and Protections

The Highclere Castle buildings are listed grade I by Historic England. The following description is found on the Historic England listing:

"A plain C18, 3-storeyed mansion arranged round a central top-lit hall, but with the exterior refaced as Elisabethan elevations in the style of Wollaton by Sir Charles Barry in 1839-42; the addition of corner turrets and an off-centre tower causes a resemblance to the Palace of Westminster (the most famous of Barry's designs). On the old brick core, and incorporating the older fenestration pattern, the Bath stone ashlar exterior is presented in 3 symmetrical elevations, of 3 storeys with a fourth storey for the corner turrets and the north and south centrepieces. The north (entrance) front has 1.3.3.3.1 windows. The pierced parapet has strapwork and pinnacles; and each storey is an Order of pilasters applied to the turrets and centrepieces, ascending as Doric, Ionic, Corinthian and Composite, with pilasters coupled on each side of the centre, and a pedestal stage containing panels. The windows have mullions and transoms, with narrow lights between panels in the turrets, the wider spacing of the sides lacking pilasters but with the frames set in raised panels. The central doorway has a shield above the Doric frame. The turrets are set forward a little and rise higher than the central attic stages. This reticulate elevation pattern is repeated on the south front, without the doorway. The east elevation is varied by a recessed centrepiece (and a rhythm of I.I niche 1.3.1 niche 1.1 windows) with the niche unit raised as a lesser turret. The tower rises as a tall 2 storeys above the roof line, with a more elaborate treatment of the Orderly design; it appears central to the east elevation but is offset westwards to the north and south elevations. The west wing is attached as a lower Tudor brick mansion, with gables and pepper pot turrets, having stone features; it is masked by landscaping. The main interiors demonstrate elaborate essays in different styles. There is a Gothic (Early English) entrance hall with stone quadripartite vaulting, and coloured marble enrichment (by Butterfield) on clustered columns and floor. The main hall (by Thomas Allom 1862) has a generally Perpendicular style, with a rich surface decoration, including C16 tapestries above Cordoba leather panels. The staircase is Gothic, occupying the large space below the tower, and leading to an arcaded corridor surrounding the upper part of the hall. The library has a classical finish, the Music Room has a mixture of C18 decoration (probably reconstituted from other parts of the house), the Drawing Room is Rococo of circa 1900."

There are a number of curtilage buildings and structures with group value that are understood to be associated with the heritage asset.

The Castle is also sited within its own grade 1 listed park and garden. This listing also has a description summary as follows:

"A late C18 landscaped park and pleasure grounds laid out by the first Earl of Carnarvon over a medieval deer park, the Earl's design for which loosely follows a plan drawn by Lancelot Brown c 1770 but also incorporates some of the built and planted elements of a late C17 and early C18 rococo garden. The pleasure grounds were further planted with ornamental shrubberies and exotics in the C19."

Methodology

This report has been established using the following methods:

Desk-Based Research

A review of archive sources and documentary sources has been undertaken. These sources are largely through online digital sources. The Basingstoke&Deane HER has produced some information for the site. In conjunction with the use of 'Historic Gateway' and archival map searches OS Map has been discovered that adds more information to the understanding.

The sources were used for initial exploratory research and also targeted following consequent discovery and realizations of key facts revealed during the process. The aim of the process has been to ensure the historic character of the site and the relevant study areas are understood sufficiently in order to appreciate the proposal's impact and to justify and mitigate impact accordingly. Primary sources have therefore included the following:

- Basingstoke and Deane Historic Environment Record (HER)
- The Historic England Archives (Swindon) Red Boxes - no relevant findings to West Facade.
- The Heritage Gateway website - no relevant findings to West Facade
- National Library of Scotland Maps website screenshots - archival OS maps
- Client's Estate Archives - Archivist's Document References from 19C, refer to email appendix.

Consultation

The proposals presented in this document have been discussed with the following prior to this application:

- The Scottish Lime Centre - Laboratory Scientists (Refer to appendix Lab Test Report)
- Roz Artis Director

There also has been dialogue with other conservation professionals and research into architectural and local history where it was appropriate to the historic fabric.

Site Inspection and Building Appraisal

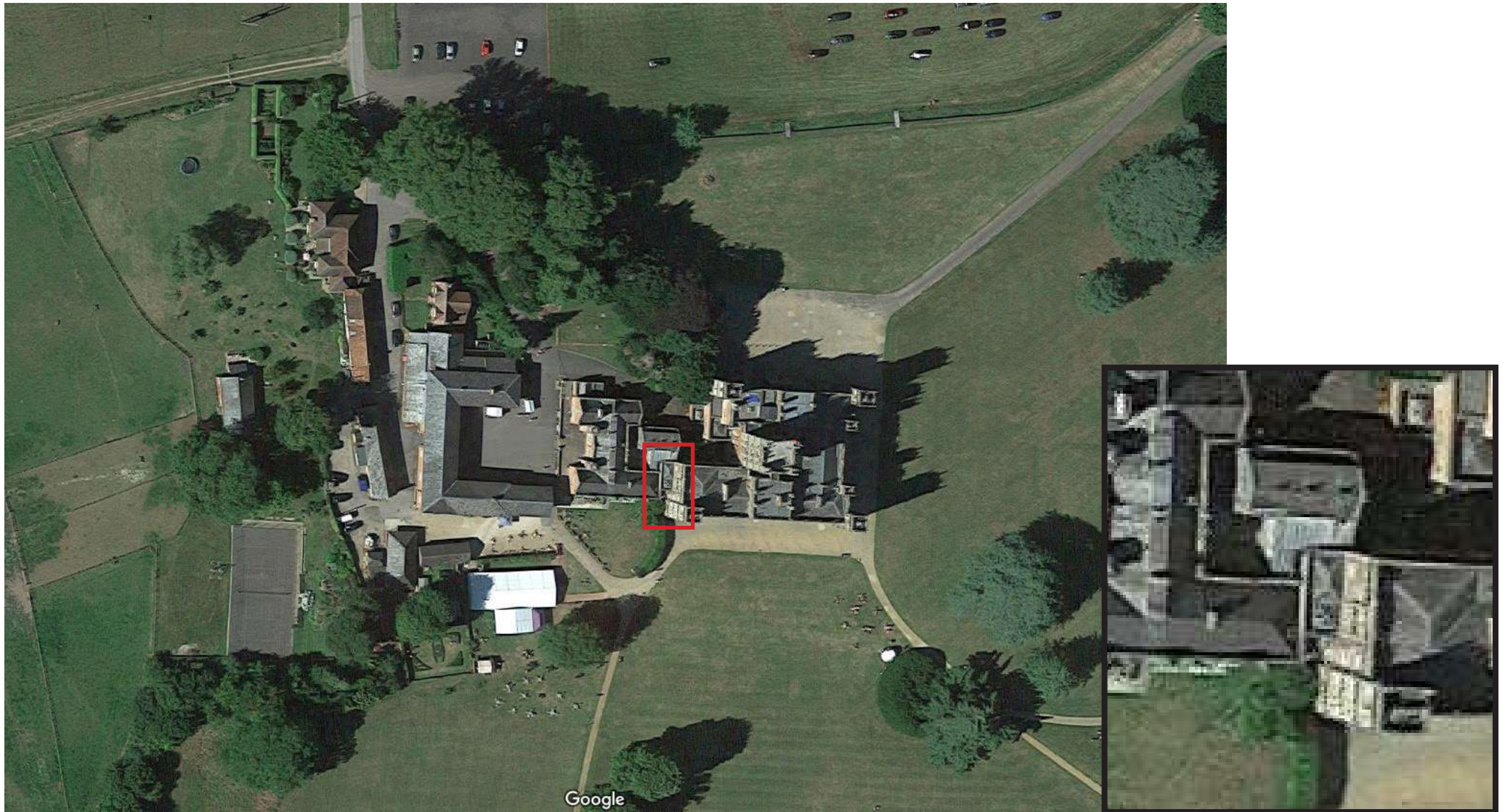
The interior and exterior of the site was inspected by Brownhill Hayward Brown's conservation department during May-August 2023. This included the ground, first and second floor levels that were accessible. The first floor roof area was explored generally around the roof parapets. There has been a general assessment of the property's West Facade in its context. These visits were to evaluate the site and its buildings, also to understand their construction, materiality, condition, usage, historical development phases, key features, assessment of significance, and any defects. The information gathered on site was cross referenced with wider research sources. A sample of failed render was also mailed to the Scottish Lime Centre Trust to allow XRD Analysis of the chemical structure.

Written Record

This document provides a synthesis of the research process. This research and analysis underpins the understanding that informs the assessments within this heritage statement. This assessment work has been undertaken by an accredited conservation architect.

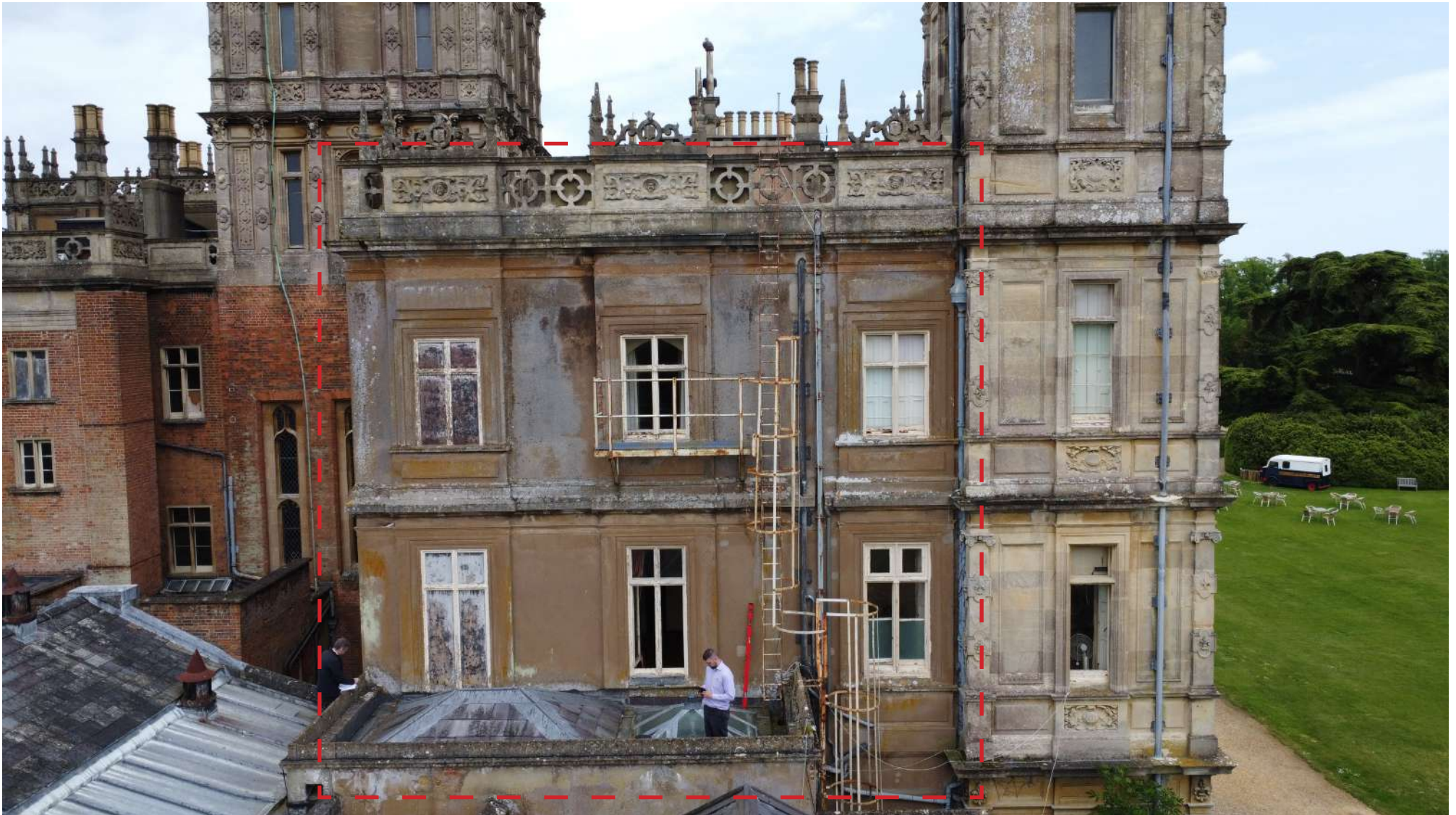
Google Aerial Map View:

Fig. 4 A google aerial view of the approximate site boundary area highlighted in red (Copyright Google 2023). Refer to the project pack for the location plan and an accurate outline of the site's specific boundaries.



West Facade Elevation:

Fig. 5 (below) A drone captured view of the site. Note the stonework tower and turret of the south elevation. Note the discoloration of the West front render, and the high level parapet in stonework.



West Facade Elevation (Second Floor only):

Fig. 6 (below) A drone captured view of the site. Note the dummy window to the left hand side.



West Facade Elevation (First Floor only):

Fig. 7 (below) A drone captured view of the site. Note the dummy window to the left hand side.



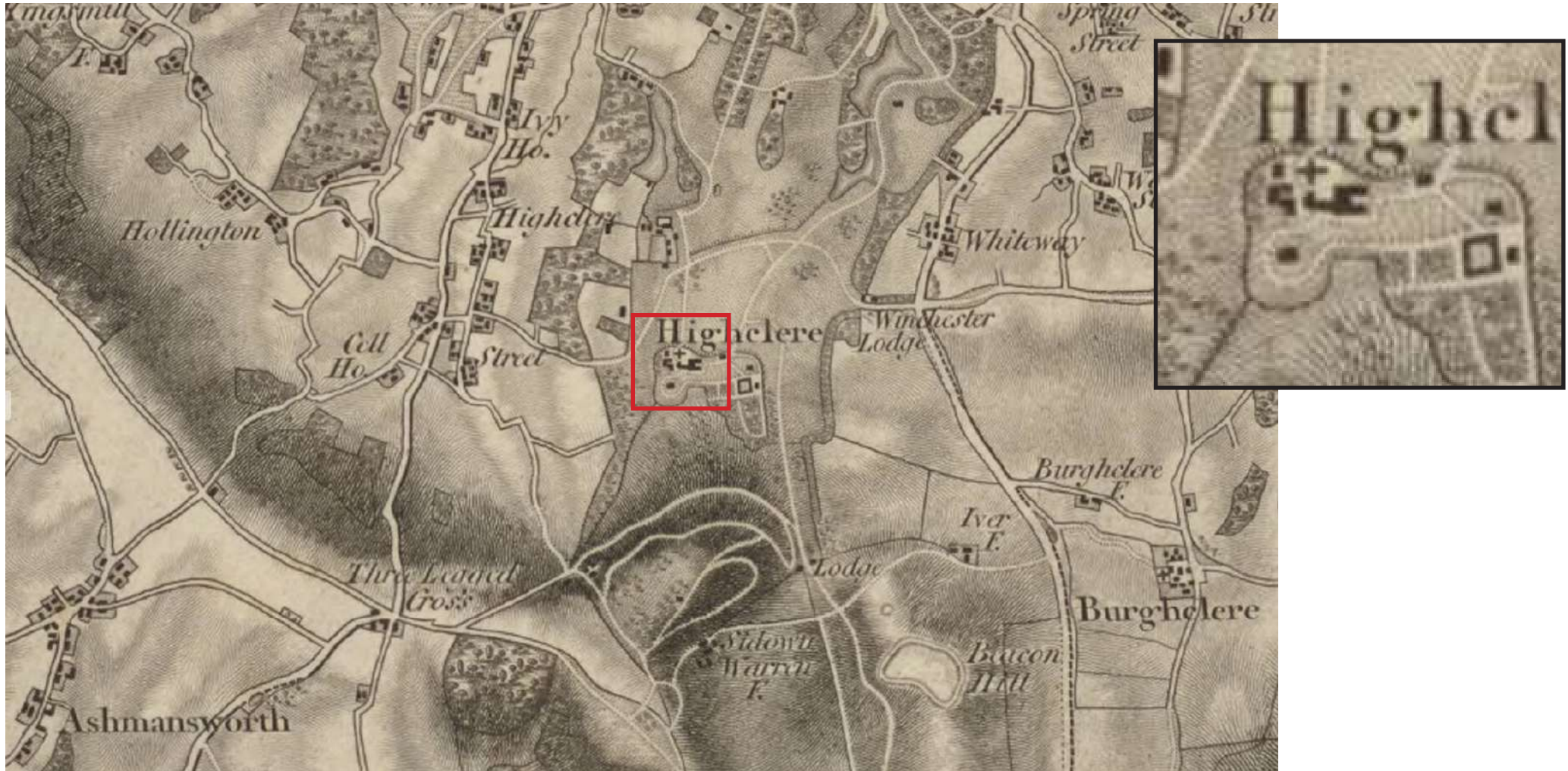
West Facade Elevation (Ground Floor only):

Fig. 8 (below) The glazed timber ground floor access door with timber framed WC window to left hand side.
Fig. 9 (right above) The fanlight glazing over the door with decorative render much concealed by drainage pipes.
Note the masonry of the south elevation tower to the right hand side. Fig. 10 (right below) Note the moldings of render to the door surround with similar failure patterns as the first and second floor.



Map Regression: 1835 Ordnance Survey Map

Fig.11. In 1835 the buildings of Highclere are not quite as we see today but the location is the same, but the building of this time forms a semi open courtyard facing East. The landscape design features of Capability Brown can be perceived to some degree.



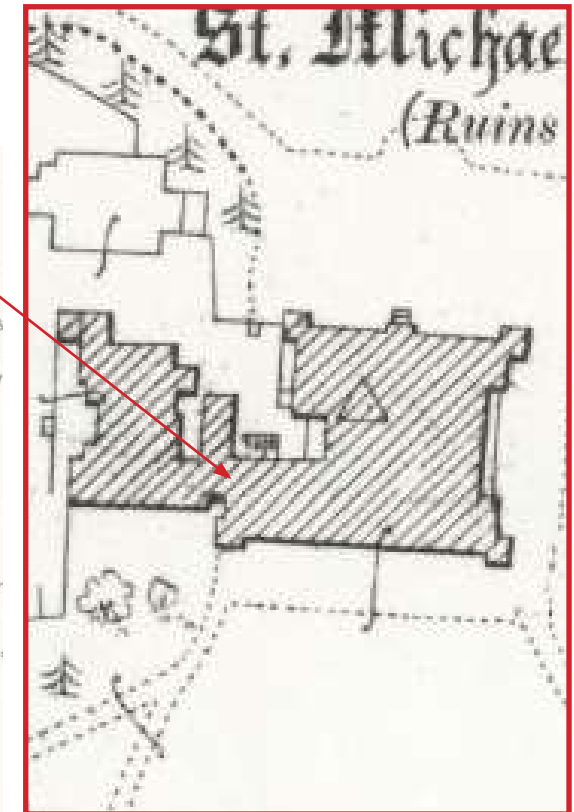
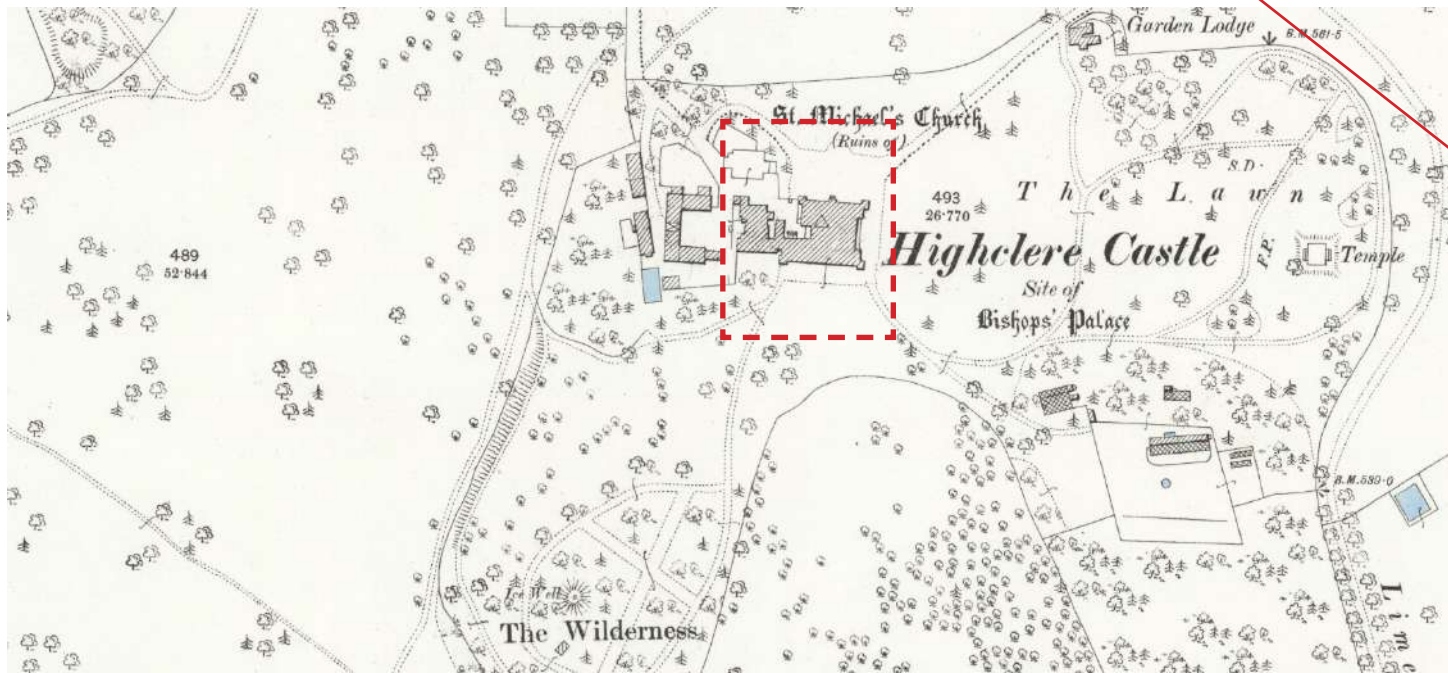
Map Regression: 1883 Ordnance Survey Map

Fig.12. (below) In 1883 the iconic form of today's Highclere Castle is now discernible with the central courtyard enclosed into the saloon and tower. The symmetry of the principal elevations and the central tower form a striking landmark in the setting of the landscape.

The least commanding elevation faces and leads into the service areas to the West. It is for this reason that the architect (Sir Charles Barry) would have felt able to economise on expensive Bath stone and revert to a rendered brickwork elevation.

Further West there is a semi open courtyard formed that provides coaching and stabling facilities, with other utilitarian buildings most of which survive today.

Fig.13. (Below) An extract of the 1883 OS map. The arrow indicating the approximate position of the rendered West facade immediately due north of the southwest corner tower.



The History of Highclere Castle and its West Facade:

The Highclere estate has origins that stretch back to the Bishops of Winchester during Anglo-Saxon times. Following the Act of Supremacy the State confiscated the land from the church and it came to the ownership of the Fitzwilliam family. From here on its private ownership and form changed several times over 125 years until the palace was rebuilt in 1679 by its new owner Sir Robert Sawyer.

The structure built in 1679 can be seen on the first edition of the Ordnance Survey Map of 1835 (refer to Fig. 11). However it was later renovated over time and most significantly during the 1840s (by Sir Charles Barry) to become what we see today. Highclere Castle's striking principal elevations face North, East and South with central tower and corner turrets. The principal elevations and tower are built in ashlar Bath stone masonry, quarried 60 miles West of the Castle. Barry was working on the houses of parliament at the same time as Highclere, the similarities can be found in the elevation

However the West facade of Highclere Castle is mostly made of rendered masonry. It was part of the works undertaken during the 1840s. Today the render is cracking and crumbling in a number of areas and a risk is presented by this ongoing weathering damage to both the original render and the later patch repairs. This project intends to address the failing render with appropriate proposed repairs.

The historic account of the grade 1 listed castle is well documented and the property is well known. It has become increasingly well known in recent years due to its setting being the primary staging for Downton Abbey.

The history of the West facade is a small part in the overall composition of the work of Barry. The West facade is found tucked behind the last Bath stone corner tower to the southwest (Refer to fig. 14), and the rendered surfaces are complete from ground floor to the stone roof parapet and cornice above the second floor. The West Front rendered wall actually returns across a north facing wall to meet the central tower masonry brickwork (Refer to fig. 14 and the green highlighted box).

During the late 20C/early 21C patch repairs have been undertaken to the rendered wall facing West. Also a painted steel ladder and gantry has been installed to provide emergency egress to the corridor window of the second floor. The rendered facade facing west has been failing for some time, but in recent years it has become clearly more noticeable from the perspective of the southern lawns. Also the falling chunks of render pose a risk to the welfare of those below and the lower roofs of the building itself.

The Site Inspections:

The West Facade and its site has been inspected and assessed by two accredited conservation architects during Spring and Summer 2023.

An initial condition assessment report confirmed that the rendered facade was indeed at risk of accelerating decay as falling pieces of render masonry risk further damage and allow weathering moisture ingress to accelerate a worsening problem. Examples of the assessed condition issues can be found in the planning submission documents (SK01 - Condition Review).

Further site inspections assessed the render in closer detail which is very hard in its nature. Elsewhere it appears to be a Roman Cement in its colour and its hardness. Some of the features at high level can be assessed from the gantry and ladder (refer to figures XXX). Access has shown that the thicker part of the decorative buildup are packed with clay tile fragments. It is thought this will have been done to avoid shrinkage cracking and to consolidate a depth of render that is up to 100mm in depth in some places.

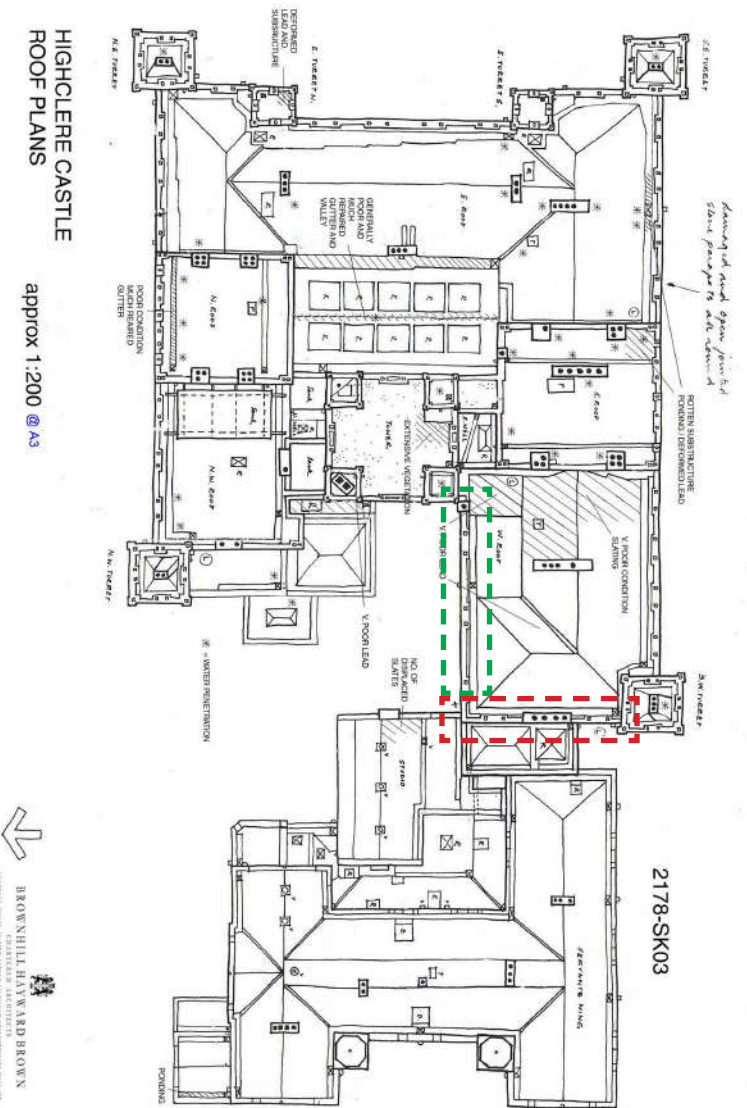


Fig.14. (Above) A sketch plan of the roof layout, showing the area of Barry's rendered facade to the West. The area coloured red is due for repair. The area returning along the North is not being considered for repair.

To allow greater understanding of the render at high level a drone was used to provide closer inspection of the parapet and cornice. This proved the render product finishes below the cornice, the cornice is itself made of stone. The cornice joints can be seen to be failing in places and the resultant washout has discoloured the render and encouraged delamination of the highest render string course.

Generally fissure cracks radiate from weak points in the render around the openings and decorative band junctions. Some fissure cracks have significantly opened up leading to the delamination of pieces of render varying in 25-200mm size. In some areas the render will eventually shear away in larger pieces, which provides cause for concern and greatly elevates the significance of undertaking conservation repairs.

A sample of fallen render (refer to fig. 15) was taken for issue to the Scottish Lime Centre so that a laboratory test might provide greater clarity on the binder. Note other areas of the lower roofs had failing render surrounding the parapets concealed from ground level view (refer to fig XX).

The Testing of the Render:

(For this section please read the X-Ray Diffraction Test Laboratory Report in the Appendices).

The fallen render sample was taken from the decorative border that surrounds the egress window to the second floor by the steel gantry. It is a classical ogee form in its nature as the render approaches its border with the timber window frames.

The render was received by the Scottish Lime Centre and considered too hard to be a conventional lime render. The Laboratory advised that a X-Ray diffraction would be the most appropriate testing method for the sample. The results and conclusions of the laboratory can be found in the appendix.

The test results can be summarised as follows:

- On the basis of the results the original mix may have been from a non-hydraulic lime.
- There were no clinker components (eg belite and alite) or pozzolans, which would have suggested a hydraulic lime or cement binder.
- There are relatively high amounts of bassanite, which suggests water percolation damage and sulphate attack.
- Given this wash out action it may suggest that original clinker components have fully hydrated. This may mean the original render was a form of Roman cement which was in use during the mid 19C. Or it may be a similar render with a guaged lime and cement mixed binder.
- Elsewhere across the estate there are rendered structures that are understood to employ a form of Roman cement.

The slightly inconclusive results of the test lead to exploration of the archive records of the Highclere Estate

Building Archive Records

The trail of email dialogue with the Highclere Estate Archivist and Historian can be found in the appendix. They specify that Lord Carnarvon 'would supply all the bricks, lime, and sand, and oak in the round'. They also specify that the external masonry used was Bath Stone or Caen Stone, and provide an option for the central tower to be in 'Highclere Cement' instead of Stone. The central tower is adjacent to the project area and its use of render is conceivable.



Fig.15. (Above) The second floor gantry egress window. The red arrow indicates where the loose render sample originated from, to the right hand side of the window reveal.

The findings also reveal that during the 1839-42 works the render product used was named 'Highclere Cement'. As yet there is no conclusive written proof of the actual material products that constituted the recipe for Highclere Cement. It is not unreasonable to conclude from the findings that the original 'Highclere Cement' was also used on sundry works across the estate such as Jackdaws Folly and the London Lodge. Therefore these structures can potentially be used as a material comparison for further understanding. For example Jackdaws Folly is understood to be rendered in a type of Roman Cement.

Further investigation into the nature of the existing render will be required. This will build upon the information already gathered about Highclere Cement and its use across the estate. The research and proposed specification for repair render will be further developed in tandem with a specialist lime/Roman Cement render contractor with good conservation experience of this period of history. Once the contract is tendered further analysis and sample testing will be undertaken to ensure the best possible match is found with the most appropriate performance.

Render Condition and Repair Proposals

The condition of the render is very poor with numerous fissure cracks and areas of delamination. A large quantity of decorative render has fallen from the facade and there are areas of high discolouration and lichen growth. Following the archive research and the X-Ray diffraction test it is believed that the render is quite likely to be a Roman cement that has suffered from significant exposure to the elements which has affected the chemistry of the binder.

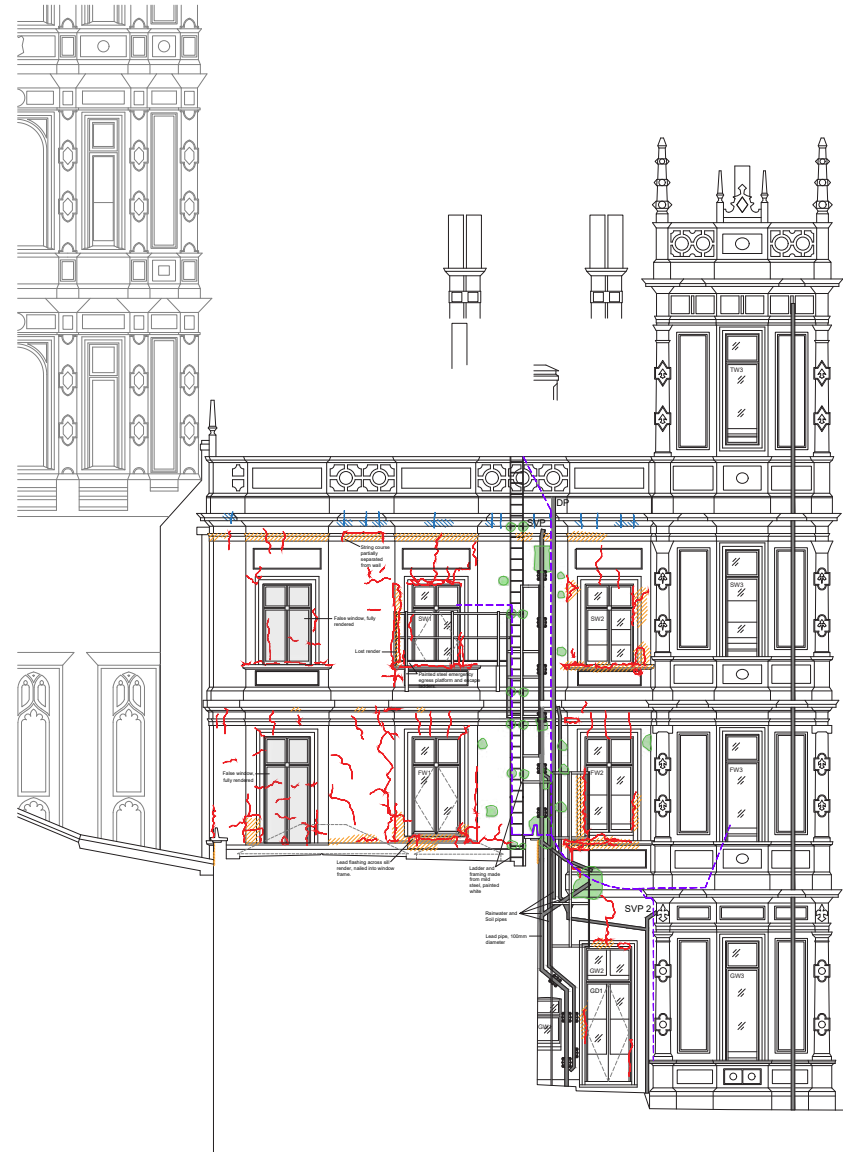
Therefore the proposals seek to remove all the render and to reinstate it on a like for like basis. This work will be done by reusing the exact moulding profiles and dimensions as recorded to reinstate the same render material using the same methods with which it was originally installed.

Fig.16. (Right) The facade viewed from the northwest. The warm tones of the Highclere Cement can be more easily seen in the lower levels that are more sheltered. The colourisation of the facade is not uniform and the mineral content is likely to vary across the facade.





Key Elevation (West)
Scale 1:200



Condition Survey Elevation
Scale 1:50


Safety Health and Environmental Information	A1																								
The following risks are identified as unusual or unfamiliar to a competent contractor																									
CONSTRUCTION RISKS There are no significant or unfamiliar risks																									
DEMOLITION RISKS (FUTURE) There are no significant or unfamiliar risks																									
It is assumed that all work will be carried out by a competent contractor working, where appropriate, to an approved method statement																									
Key:																									
- Area of Proposed Works																									
- Crack in render over 1mm wide (including fabric erosion up to 3mm wide pieces)																									
- Joints in Stone																									
- Lost/delaminating render																									
- Patch repair from 20th Century																									
- Stone damage (erosion)																									
- Cables trailing across facade																									
Notes:																									
- Windows GW1, GW2, FW1, FW2, SW1 & SW2 all framed in timber, painted white.																									
 brownhill hayward brown CHERISHED ARCHITECTS																									
<table border="1"> <tr> <td>Project Name</td> <td>Highclere Castle - Render Repairs</td> <td>Project No</td> <td>4007-011</td> </tr> <tr> <td>Client</td> <td>West Wing - Condition Survey</td> <td>Date</td> <td>Jul 23</td> </tr> <tr> <td>Project Location</td> <td>Highclere Estate</td> <td>Project No</td> <td>4007-011</td> </tr> <tr> <td>Project Status</td> <td>LISTED BUILDING CONSENT</td> <td>Project No</td> <td>4007-011</td> </tr> <tr> <td>Project Status</td> <td>SPF</td> <td>Project No</td> <td>4007-011</td> </tr> <tr> <td>Project Status</td> <td>As Shown @ A1</td> <td>Project No</td> <td>4007-011</td> </tr> </table>		Project Name	Highclere Castle - Render Repairs	Project No	4007-011	Client	West Wing - Condition Survey	Date	Jul 23	Project Location	Highclere Estate	Project No	4007-011	Project Status	LISTED BUILDING CONSENT	Project No	4007-011	Project Status	SPF	Project No	4007-011	Project Status	As Shown @ A1	Project No	4007-011
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Fig.17. (Right) The facade condition survey. (Refer to Architect's drawings). This drawing shows the degradation is most prominent in the more exposed locations. Areas of 20C patch repair show the failing integrity of the render has been an issue during recent decades.

Overview of Proposals and Heritage Impact Assessment Structure

Overview of Proposals

The proposals are defined by the Architect's drawings and package of information. The following pages diagrammatically capture alterations to the fabric by loss, alteration and/or addition. The proposals should be considered in conjunction with the full planning application package.

Key Plans

The following pages breakdown the impact on the heritage asset by identifying specific areas where there is removed fabric and added/alterd fabric. All areas of change are highlighted in colour. The key plans present alphanumeric index codes that identify these key interventions across the heritage assets. These interventions are consequently assessed for significance of that part of the heritage asset, impact of the intervention, and finally a brief justification summary with any relevant mitigation.

Heritage Asset Contribution of Significance

The significance of the site is not uniform, and varies across the building's elements. The understanding of the significance is informed by the preceding sections of this document. The significance is further examined for each specific element within the impact assessment. The valuing of significance has been derived from the methodology of the report outlined earlier, and the experience of an accredited conservation architect. The adjacent chart summarizes how the significance of each asset is conveyed and assessed.

Impact of Proposals

The impact is assessed in proportion to the significance of the asset. Not all changes to historic structures are harmful and indeed can be beneficial. The facts of the intervention and the perceived impact are recorded. The adjacent chart summarizes how the impact on the asset is judged.

Justification and Mitigation

Following the recording of significance of the asset and the impact of the proposals a weighed outcome is briefly stated. Residual heritage impact with frequent occurrence is also summarized with a referencing code as follows:

- A - Fabric has low significance and/or may be detrimental to the more significant assets.
- B - Loss of historic fabric is minimised with fabric recorded (surveys and photographs).
- C - Loss of historic fabric is minimised, suitable removed material will be salvaged for reuse.
- D - Loss of historic fabric is justified by like for like methodology that ensures ongoing survival of the asset and supports its wider contextual significance.
- E - New installations are reversible and/or will result in improvements to the historic fabric.
- F - The historic form or essence of this area or element can be retained within the proposals.

Supporting Information and Appendices:

The listed interventions will occasionally in the scheduled text refer to figured key photos. The photos can be cross referenced to the appendix of this document.

Discussion and Evaluation

Whilst some of the evaluation of the proposals inevitably occurs within the schedule. The overall evaluation is provided and discussed in the closing section of this document. The conclusions of the project should be read in conjunction with the schedule.

Impact	Effect of the Proposals	Impact Ref:
Very Positive	Proposals will greatly reveal or enhance the contribution the effected element makes to the significance of the heritage asset, and/or substantially contribute towards the conservation of the asset.	++
Positive	Proposals will better reveal or enhance the contribution the effected element makes to the significance of the heritage asset and/or contribute towards the conservation the asset.	+
Neutral	Proposals will preserve the contribution the effected element makes to the significance of the heritage asset.	O
Negative	Proposals will result in the partial loss of the positive contribution the effected element makes to the significance of the heritage asset and/or will have a detrimental effect on the conservation of the asset.	-
Very Negative	Proposals will result in the total loss of the positive contribution the effected element makes to the significance of the heritage asset and/or will have a significant detrimental effect on the conservation of the asset.	--
Uncertain	Effect uncertain: more information required.	?

Value	Contribution to Significance	Value Ref:
High	Element is fundamental to the key heritage interest/s that define the significance of the asset.	H
Medium	Element makes an important contribution to the significance of the asset, either as embodying a secondary aspect of the asset's heritage interest or comprising an aspect of the asset's key heritage interest that has been affected by moderate (under 50%) loss such that its contribution to significance is reduced.	M
Low	Element makes a slight contribution to the significance of the asset, either as embodying that complements an aspect of the asset's heritage interest or comprising an aspect of the asset's key heritage interest that has been affected by substantial (over 50%) such that its contribution to significance is greatly reduced.	L
Neutral	Element does not contribute to the significance of the asset.	N
Negative	Element represents an unsympathetic change which detracts from significance.	Neg
Uncertain	Sensitivity uncertain: more information required.	?

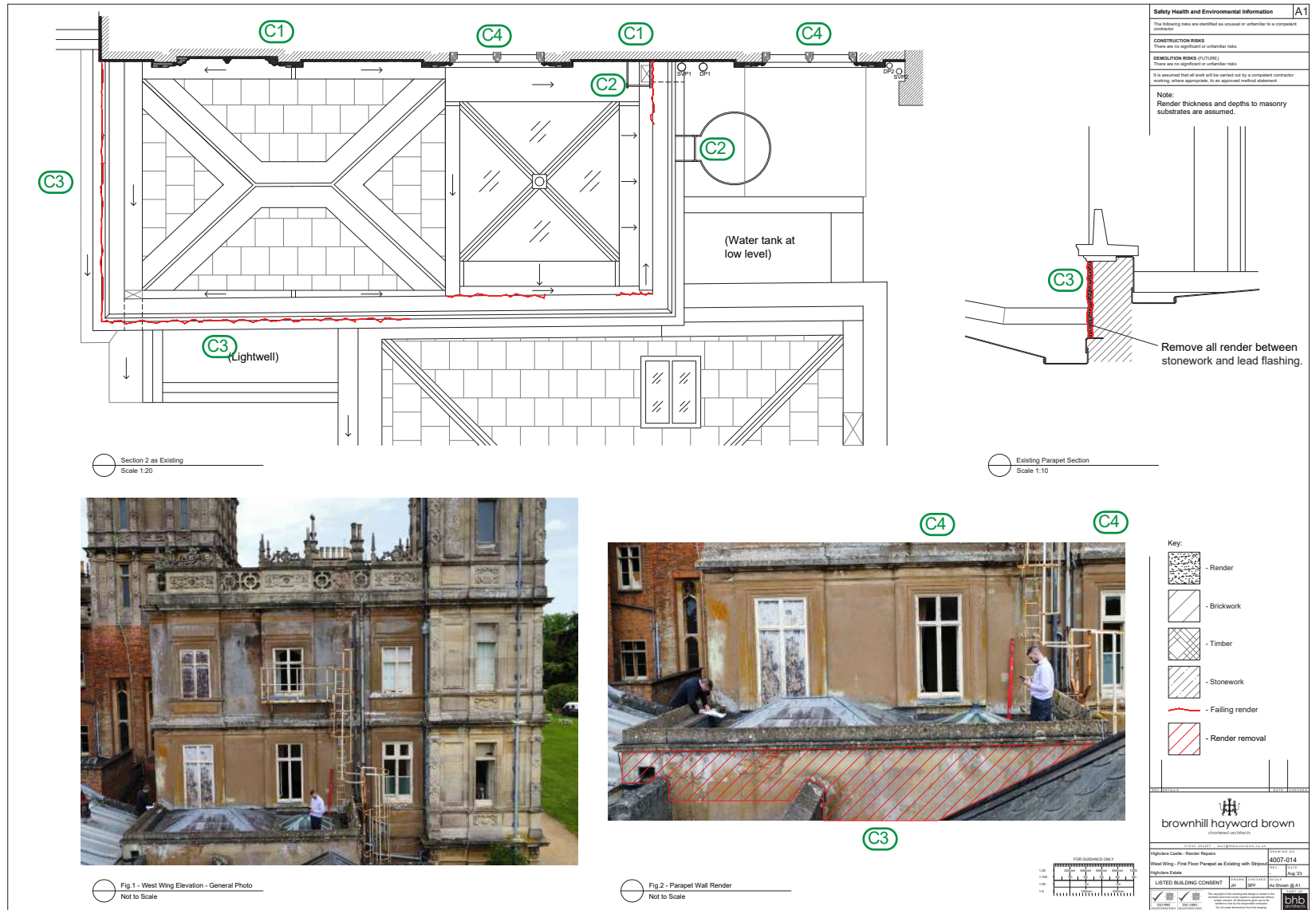
West Elevation as Existing - Demolitions and Stripout

Fig.18 (Below) Architect's drawing showing the areas of render removal to the Castle's West Elevation.



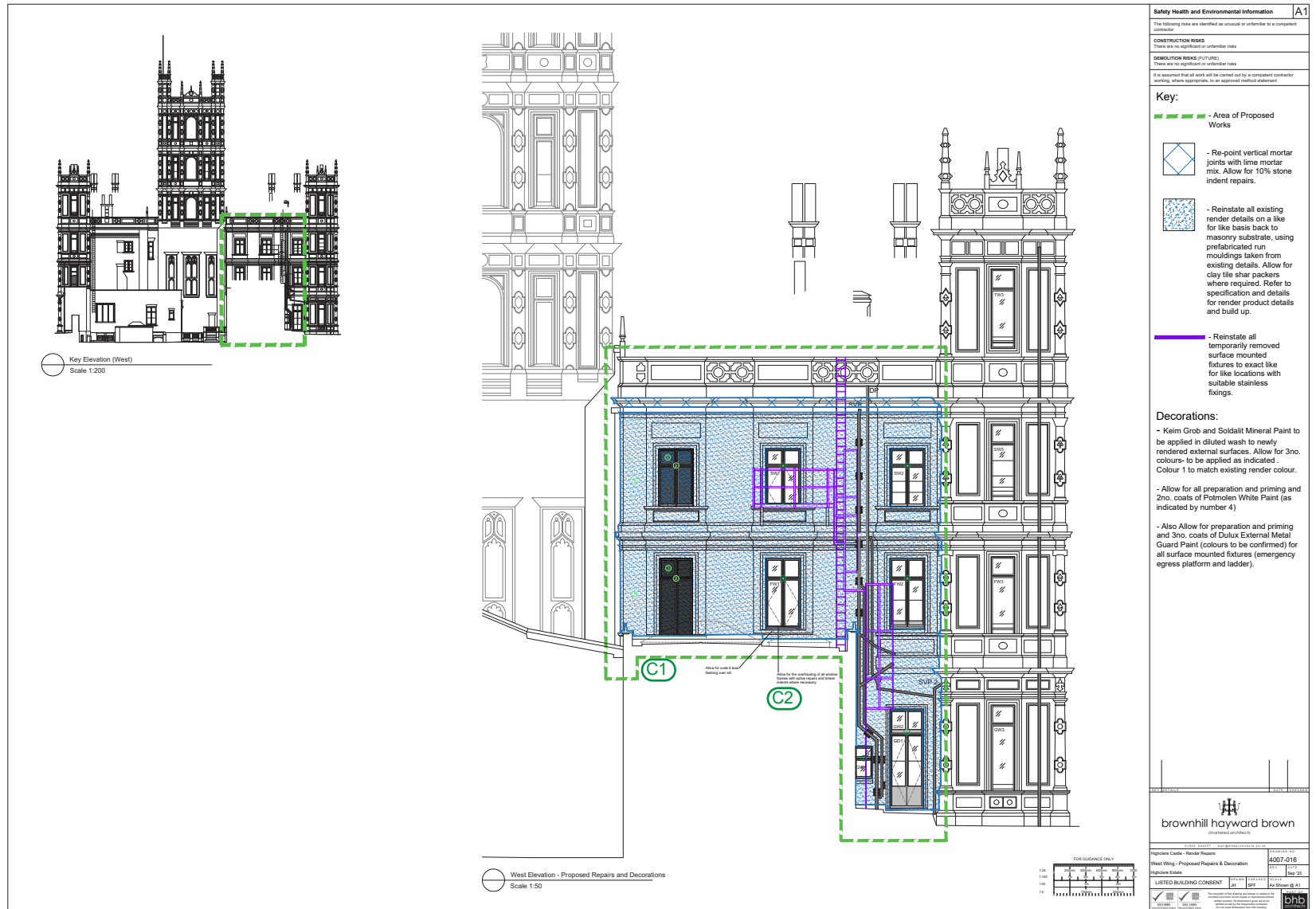
West Wing Roof Plan as Existing - Demolitions and Stripout

Fig.19 (Below) Architect's drawing showing the areas of render removal to the parapet walls of the West Wing roof (near the Castle's West Elevation).



West Elevation as Proposed with Repairs

Fig.20 (Below) Architect's drawing showing the areas of render replacement to the Castle's West Elevation.



Heritage Impact Assessment

Loc'n Ref.	Fig. Ref.	Proposed Work	Impact Ref:	Significance of the affected historic fabric	Signif Ref:	The impact of the proposed works on the historic fabric and its justification / mitigation	Justif'n Ref.
C1	18-22	The like-for-like replacement of all the render on the West facade as noted on the drawings. The cleaning and minor patch repairs of the stonework corncicing. The completed repaired render will be redecorated with mineral paints to ensure that the render tonally matches its adjacent surroundings. The dummy windows will also be redecorated with mineral paints.	++	The facade is a part of Barry's scheme of works dating back to the 1840s. The West facade is not a principal elevation of Bath Stone like the other cardinal elevations. The West facade is an example of the documented use of the more economic 'Highclere Cement'. The render specification is thought to be a form of 19C Roman Cement found used throughout the Estate. The level of decoration is ornate and commensurate with the level of detail found on the main principal elevations. The render is applied to the wall's brickwork substrate. However some corncicing is stonework. Highclere Castle's symmetrical design is iconic and this wall does play a minor role in presenting Barry's compositional device. The facade may not be a principal elevation but is prominent from the southwest end of the lawns. The facade rises above the West wing with some presence for those in the working areas of the stable block courtyard.	M	<p>The repairs will result in the loss of original fabric. However almost complete original fabric survives to the wall's north face that returns into the central tower of the castle. That surviving render to that other wall is in relatively good condition and will help ensure correct replication of proposed detailing.</p> <p>The West facade render is in very poor condition and failing in numerous areas, detracting from its significance. If it is not repaired it will continue to fall off and allow moisture ingress to accelerate further fabric repair issues. The poor condition of the West facade is unsightly and letting down the overall composition of Barry's work. The repairs will employ as close a recipe match as possible to the original, the form will be like for like in dimensions and composition. It is considered that 'Highclere Cement' is a form of Roman Cement from the 1840s that is unique to Highclere's estate. The existing render chemistry has revealed no clinker components in the X-Ray diffraction results. However sulphate attack and the presence of Bassanite suggests secondary mineralisation and the hydration of original chemical components. Therefore the evidence of Roman cement type mortars being found elsewhere on the Estate - along with the archivist's information on Highclere Cement - will lead the development of the repair render recipe an in tandem with a specialist render contractor's involvement.</p>	B, D, F
C2	18-22	The temporary removal and reinstatement of gantry ladders and drainage pipes to facilitate access to the render repair works. The overhauling and redecoration of the gantry ladder steelwork.	++	The ladders and gantry are not original and are a necessary requirement for the safe egress of occupants using the upper floors of the castle.	N	The proposed removal and reinstatement will be necessary to allow the render to be appropriately repaired. The steelwork is in very poor decorative condition, its redecoration will benefit the historic asset.	A, C, E
C3	18-22	The like for like replacement of failing and delaminating render to the parapet walls of the lower west wing roof identified on the drawings.	++	The render is probably original but it appears to have been patch repaired in some areas.	L	The render to the parapet walls cannot be seen from the ground level and often even from the windows, and it is largely utilitarian in its nature. By replacing the render the maintenance of the building can be secured for another generation.	B, D, F
C4	18-22	The timber window frames will be lightly overhauled and fully redecorated to match the existing adjacent.	++	The window frames are original and part of Berry's composition. The framing timber is generally in good condition with small areas of rot. However the paintwork is flaking badly.	M	The minor repairs to the timber windows are necessary to avoid further rot and degradation of the window integrity. Just as necessary is the full redeclaration to ensure the protection of the fabric.	C, E, F

The Assessment of Heritage Impact & Evaluation

The overall impact of the proposals is simply to repair an elevation that has reached the end of its safe lifespan for adequate weathering and protection of both the historic asset and its occupants. There is a glass roof below the render that is vulnerable to falling masonry shattering the glass and causing great injury to occupants. There is also a usable door at ground level that is vulnerable to falling masonry. There is a risk of falling masonry to the maintenance team who access the first floor roofs

The proposals have intentions to directly address these health and safety and maintenance issues. The fundamental failing condition of the existing fabric will be directly addressed in a sympathetic and appropriate manner. The proposals only seek to reinstate a like for like replication of the existing facade render. The proposals also propose to fully redecorate the completed work to enhance the aesthetic significance of the West facade by restoring it to its original splendour with authentic like for like detailing and tonal colour match.

This repair work will be undertaken by a conservation experienced contractor with the primary assistance of a specialist contractor with significant experience of the conservation and application of historic renders. The specialist knowledge of the historic render contractor will be used to help develop the proposals further on site.

The overall impact of like-for-like render repairs on the building is very good. Whilst there is some loss of original fabric it is unfortunately not safe to retain material that is understood to have washed out binders causing material failure. So a full replacement is the best course of repair to guarantee the security of the fabric, and ensure the significance of the facade is retained without compromising safety.

Conclusion

It is therefore our opinion that the proposals appropriately manage the issues and challenges of a highly significant historic building in a variable condition. The proposals can be understood to have a net positive affect on the historic property subject to the understanding outlined within this report.

By undertaking the work the significance of the asset will survive, be protected and be aesthetically enhanced. Furthermore the threat of dangerous falling masonry and ongoing moisture damage will be addressed for future generations.

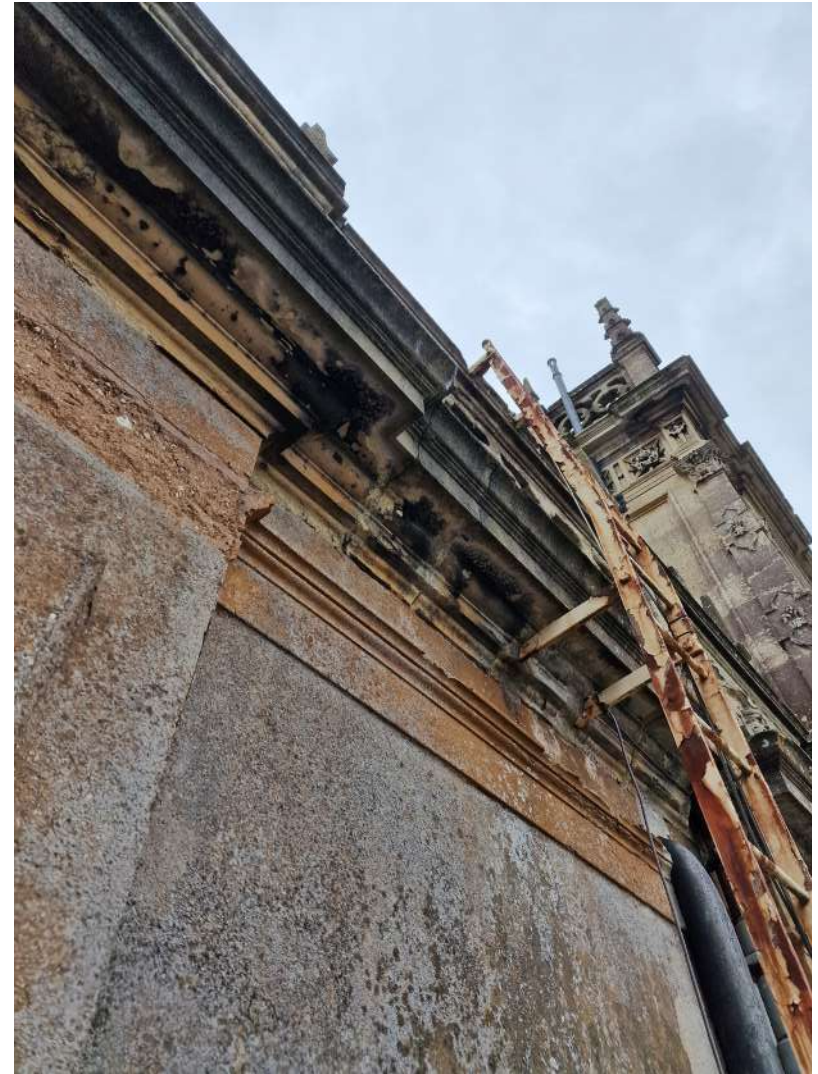
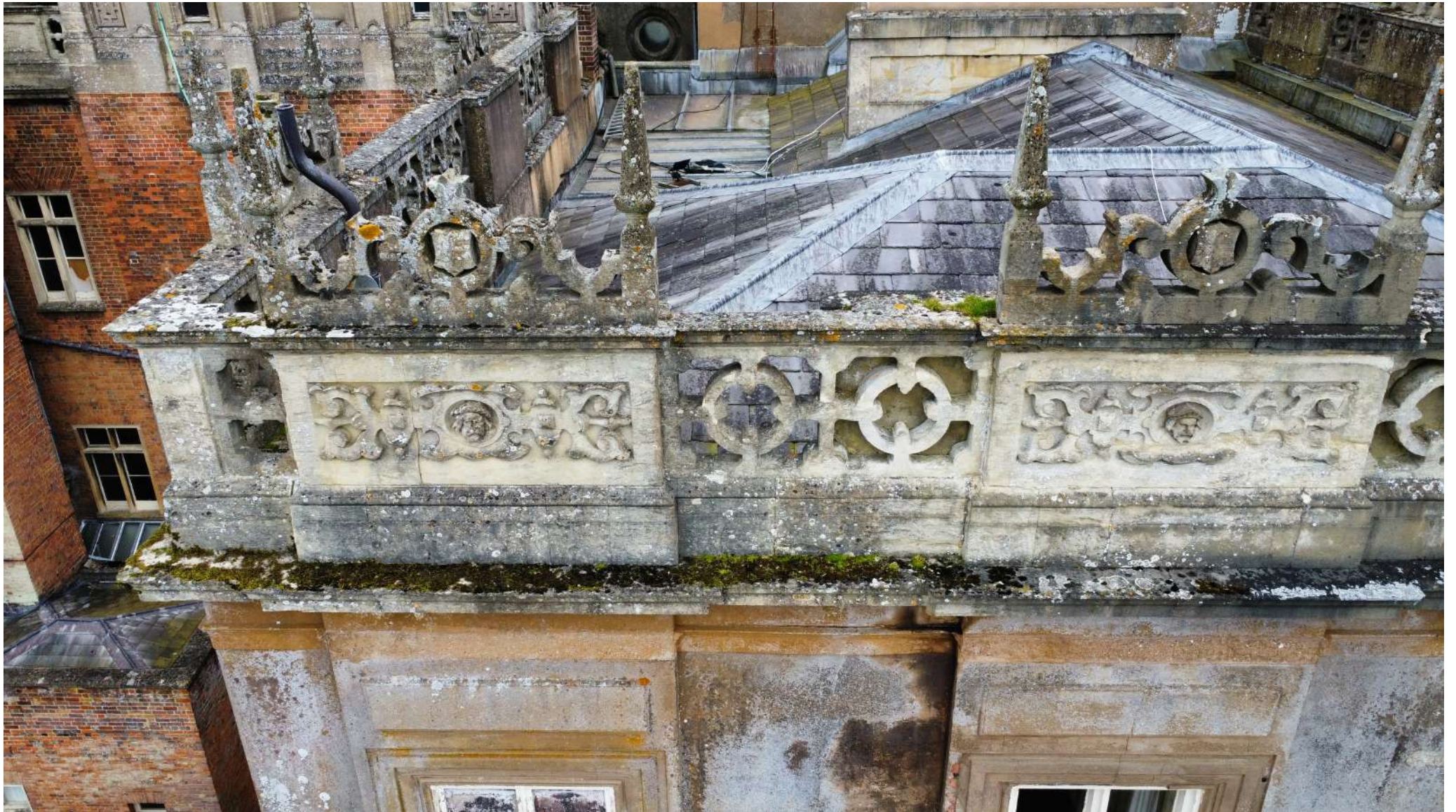


Fig.23 (above) Looking up at the West facade's stone cornice. Wash out of the vertical masonry joints can be seen alongside the soffit's discoloration.

Fig.24 (right) A drone's view of the stonework parapet and cornice that shelters the render facade below.ttt



APPENDIX IMAGES



Fig. 25 The adjacent rendered wall that faces North to meet the central tower.



Fig. 26 The adjacent rendered wall that faces North to meet the central tower.



Fig. 27 The ground level view of rendered walls are frequently obscured by the West wing.



Fig. 28 The adjacent rendered wall that faces North to meet the central tower.

APPENDIX IMAGES



Fig. 29 An example of render falling around the gantry window head.



Fig. 31 Fissure cracks emanating from the corner stress lines.



Fig. 30 Fissure cracks in the decorative render.



Fig. 32 Collapse of the render face to reveal the clay tile fragments used as packers.

APPENDIX IMAGES

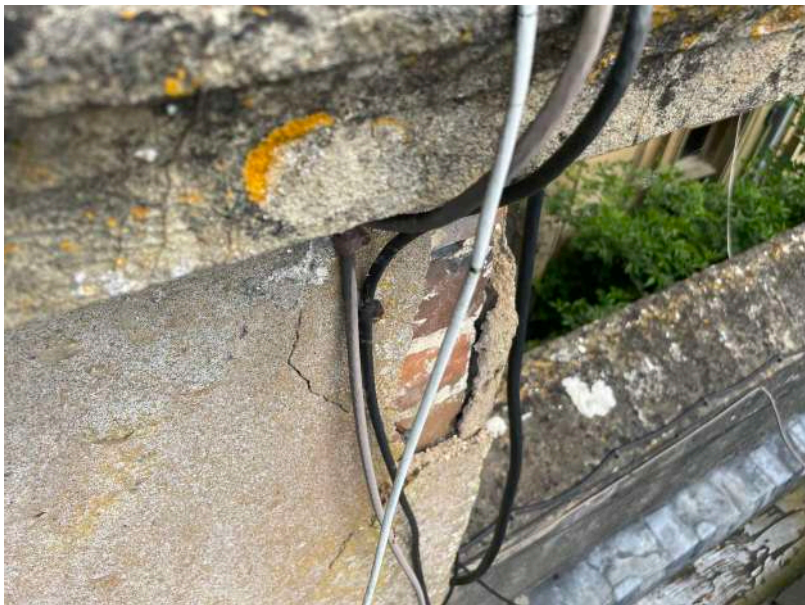


Fig. 33 Failure of the lower roof's parapet render towards the outside southwest corner.



Fig. 35 The falling render flashed below the roof egress window to the first floor



Fig. 34 The poor condition of the gantry steelwork decorations.



Fig. 36 The adjacent North facing facade in better condition.

Appendix - Email Correspondence between Conservation Architects and Archivist Historian

Stephen Pitt-Francis

From: Rymill, David <david.rymill@hants.gov.uk>
Sent: 25 August 2023 14:10
To: Stephen Pitt-Francis
Subject: RE: Highclere Castle west facade - archives

Hullo Steve,

Thank you – I fear I have still not found an answer to this.

Yesterday I was at Highclere and I finished going through the box of correspondence about the remodelling, but I am afraid I found nothing else relevant.

Back in Winchester, we also hold some papers referring to the remodelling of the Castle, which came as part of an archive originating with Broome Pinniger of Newbury, who was Steward of the Highclere Estate at the time of the remodelling.

These include a bundle of papers relating to the rebuilding and maintenance of the Castle, the Temple and other buildings in the Park, mainly 1839-42 and 1850-2 (15M52/437), including the 'Conditions of Contract for Sundry Works proposed to be done for Lord Carnarvon at Castle Highclere, Hampshire' which is undated but on paper watermarked 1837 – which is presumably the conditions for the tender for the main remodelling project. It mentions that Lord Carnarvon would supply all the bricks, lime and sand, and oak in the round. It is mentioned that 'The difference of expense of constructing the Central Tower entirely of Brickwork (forming proper cores of York Stone for the Cornice and other projections where requisite) covered with Highclere Cement – the parapets, cappings and all ornamental work being cast in the same material, and the casing of it with stone as described in the Specification is to be stated in the Contract [should that be 'in the tender', I wonder?]. This is presumably a document that was to be given to builders being invited to tender, and I had hoped that this would explain what Highclere Cement was – but it does not seem to do so.

Also in the records originating with Broome Pinniger is a ledger relating to the brick kiln on the Estate (15M52/7); this includes extensive accounts for building materials supplied to Lord Carnarvon (even though it was apparently his own brick kiln, there is a still an account of charges to him, just as the ledgers regular include cross-charging between other departments on the estate, although presumably no cash changed hands) and some of these appear to relate specifically to the Castle rather than other estate properties; the materials supplied include lime, building bricks, paving bricks, arch bricks, clam bricks, splade bricks, coping bricks, kiln bricks, pipes, plain tiles, slate brick tiles and ridge tiles. Again, I'm afraid, I can see no mention of cement – I wonder, was Highclere Cement made from the lime being supplied from the estate?

I am sorry not to be more definite. If I come across anything else I will let you know, but I have run out of ideas of anywhere to look at present.

Best wishes,

David.

David Rymill, archivist, Hampshire Archives and Local Studies, and archivist to the Highclere Estate,
Hampshire Record Office, Sussex Street, Winchester, Hants SO23 8TH
Telephone 0370 779 1742 (direct line); (01962) 846154 (reception)

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Email: david.rymill@hants.gov.uk
Website: www.hants.gov.uk/archives

Hampshire Record Office is open on Tuesdays, Wednesdays and Thursdays, 9.30am to 4pm; you do not need to make an appointment. You can order documents from the strongrooms (up to 5 at a time) between 9.30am and 12 noon and between 1pm and 3pm (document retrievals may be restricted at busy times). If you wish, you may order up to 10 items in advance (please contact at least 24 hours in advance). We will also be open on Saturday 14 October 2023. You might like to search our online catalogue at <https://calm.hants.gov.uk>, read our [blog](#), or follow us on [Facebook](#) or on [Twitter](#).

From: Stephen Pitt-Francis <sPitt-Francis@bhbarchitects.co.uk>
Sent: Thursday, August 24, 2023 11:03 AM
To: Rymill, David <david.rymill@hants.gov.uk>
Subject: RE: Highclere Castle west facade - archives

Hi David

We seem to have got so close and yet still so far as to knowing what Highclere Cement is!

If you find anything else on cement please do let me know, otherwise for now it remains an unsolved mystery!

Thanks
Steve

Stephen Pitt-Francis
Associate Director
BROWN HILL HAYWARD BROWN
Chartered Architects

D | 01543 477595
E | sPitt-Francis@bhbarchitects.co.uk
W | www.bhbarchitects.co.uk
T | 01543 254357



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Appendix - Email Correspondence between Conservation Architects and Archivist Historian

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From: Rymill, David <david.rymill@hants.gov.uk>
Sent: Monday, August 14, 2023 11:08 AM
To: Stephen Pitt-Francis <sPitt-Francis@bhbarchitects.co.uk>
Subject: Re: Highclere Castle west facade - archives

Hullo Steve,

Thank you - I am glad it is of some interest.

I was at Highclere again on Thursday and continued working through other papers in the box relating to the rebuilding, Box 4A.

There is an abstract of the tenders submitted by eight builders for the work, giving different prices for the use of Bath stone or Caen stone for both the external masonry and (separately) the carving; there is also a figure for the deduction that would be made 'if Central Tower is of Highclere Cement instead of Stone' - but again we are not told what is meant by Highclere Cement, although presumably the builders must have been told. Mr Jackson's tender was £9,467 for Bath stone or £10,646 for Caen stone, with a deduction of £472 for the use of cement for the tower.

I didn't finish going through the box (although the remaining bundles looked less promising) and I may not be at Highclere again this week but I will also check some papers that we hold in Winchester relating to building work on the Estate around the time of the remodelling of the Castle (15M52/437) – I think these probably relate mainly to smaller building projects on the Estate rather than to the Castle itself, but I will have a look – and it is possible that even if they don't relate to the Castle they just might still give a clue to the cement that was in use on the Estate at the time.

Kind regards,

David.

From: Stephen Pitt-Francis <sPitt-Francis@bhbarchitects.co.uk>
Sent: 08 August 2023 09:52
To: Rymill, David <david.rymill@hants.gov.uk>
Subject: RE: Highclere Castle west facade - archives

Hi David

Thank you, this is very helpful indeed even if at this stage it is not yet entirely conclusive.

The aspects of interest to me I have highlighted red below: In essence Highclere Cement and Keen Patent Cement (as understood in those days at this place), are of great interest.

I have also relayed your email to the Scottish Lime Centre Lab, who have tested a render sample and are struggling to reach a conclusive definition of the product. They may come back with more questions for you too.

Kind regards
Steve

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Stephen Pitt-Francis
Associate Director
BROWNHILL HAYWARD BROWN
Chartered Architects

D | 01543 477595
E | sPitt-Francis@bhbarchitects.co.uk
W | www.bhbarchitects.co.uk
T | 01543 254357



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From: Rymill, David <david.rymill@hants.gov.uk>
Sent: Monday, August 7, 2023 5:07 PM
To: Stephen Pitt-Francis <sPitt-Francis@bhbarchitects.co.uk>
Subject: Re: Highclere Castle west facade - archives

Hullo Steve,

I am at Highclere today and have started investigating.

The contract between the 3rd Earl and Thomas Jackson, dated 6th May 1842 (Box 4A no. B8) seemed a good starting point. It does refer to three cement types but so far as I can see it doesn't go into detail about the exact composition, and I am not sure if it includes a reference to the specific portion of the Castle you are interested in at present.

On the fourth page of the agreement (the pages are unnumbered) there is a requirement 'That the Central Tower of the Buildings to be erected shall be constructed of Brickwork and proper Cores of York Stone for the Cornice and other projections where requisite and be covered with Highclere Cement.'

We do not seem to be told what is meant by Highclere Cement; I wonder if it came from the brick kiln at Whitway, owned by the Earl of Carnarvon. There is a ledger relating to the kiln, in Hampshire Record Office (my regular office), recording sales of bricks, tiles, pipes etc (ref

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Appendix - Email Correspondence between Conservation Architects and Archivist Historian

15M52/7); it does include sales (presumably for notional accounting purposes to the Earl, but unfortunately only starts in 1845 (ref 15M52/7).

The agreement is followed by the specification, in which the pages are numbered. On page 2, in the section about the Ground floor, the sub-section concerning the Principal Staircase includes the words 'Build the Piers for Archways on East side in Roman Cement... build the Walls of the Staircase on the South West and North sides in Roman Cement from the Springing of the Arches on the Ground floor to the level of the ceiling of the Two Pair Floor'

On page 3, in the 'One Pair Story' section, sub-section titled 'Great Tower and Principal Staircase': 'The Tower Walls forming the Principal Staircase to be entirely new on the North South and West sides, and the Piers Arches and Wall over them on the east side to be built in Roman Cement...'

I see that Roman cement is described at https://en.wikipedia.org/wiki/Roman_cement, but no doubt you know a lot more about this.

On page 5, in the section dealing with the 'New Roof over Private Apartments West End' we are told 'The framing over the Roof forming the Return to the Centre Compartment on the South side is to be of Oak 6 x 3 up to the Cornice covered with Keene's Patent Cement on Oak heart laths. The remainder of Brick mouldings to match those of the Stone Parapet. **The return over the Roof of the Centre Compartment on the North side to be carried up in Brickwork to the level of the underside of the Capping of the Parapet and covered with Keen's Patent Cement.'**

A quick look online suggests that the spelling Keene is more often used - eg https://en.wikipedia.org/wiki/Keene%27s_cement_plaster; <https://www.proquest.com/openview/97aa067627029c9c16cdfcb6fa54816f/1?pq-origsite=gscholar&cbl=46154>.

I am not sure if this helps at all but I thought it was worth giving all these quotations as it gives some indication of the various sorts of cement that were being used.

I should be back at Highclere on Thursday and hope to investigate further then.

Best wishes,

David.

From: Stephen Pitt-Francis <sPitt-Francis@bhbarchitects.co.uk>
Sent: 04 August 2023 09:41
To: Rymill, David <david.rymill@hants.gov.uk>
Subject: RE: Putting you in touch

Hi David

That all actually sounds very promising. Enjoy your weekend and will look forward to hearing from you. Perhaps even next week if that's not too soon.

Many thanks
Steve

Stephen Pitt-Francis
Associate Director

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BROWNHILL HAYWARD BROWN

Chartered Architects

D | 01543 477595
E | sPitt-Francis@bhbarchitects.co.uk
W | www.bhbarchitects.co.uk
T | 01543 254357



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From: Rymill, David <david.rymill@hants.gov.uk>
Sent: Thursday, August 3, 2023 10:20 PM
To: Stephen Pitt-Francis <sPitt-Francis@bhbarchitects.co.uk>
Subject: RE: Putting you in touch

Hullo Steve,

Thank you for your email and for the attached photographs.

(I confess I had never realised there was a dummy window there although I quite often stand by the adjacent genuine window with the metal gantry as I get a better signal there than in the archive room along the corridor, and indeed I let John Gundill know that I'd spotted some bits of loose masonry there a few months ago – I don't know if that's what has prompted this!)

I am on leave for a few days, but I hope to be at Highclere on Monday and Thursday next week, so I will investigate then – would that be soon enough? I am not sure the records are quite detailed enough to give the composition of the render, but I will see what I can find. There is a copy of the contract and specification between the 3rd Earl and Thomas Jackson of Pimlico, builder, 6 May 1842 (there is also a copy at my regular workplace, Hampshire Record Office, 15M52, Pinniger papers), and conditions of Contract for Sundry Works...at Castle Highclere (Box 4A no. B8), which could be worth trying in case they specify the type of render; there are also lists of materials which could give a clue to what components were being used, but as some of the materials such as lime and sand could have been used in various aspects of the work, it may not be easy to work out which materials were intended for use in the render.

I will be in touch again once I have investigated.

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Appendix - Email Correspondence between Conservation Architects and Archivist Historian

Best wishes,

David.

David Rymill, archivist, Hampshire Archives and Local Studies, and archivist to the Highclere Estate, Hampshire Record Office, Sussex Street, Winchester, Hants SO23 8TH
Telephone 0370 779 1742 (direct line); (01962) 846154 (reception)
Email: david.rymill@hants.gov.uk

From: Stephen Pitt-Francis <sPitt-Francis@bhbarchitects.co.uk>
Sent: Wednesday, August 2, 2023 10:00 AM
To: Rymill, David <david.rymill@hants.gov.uk>
Subject: RE: Putting you in touch

Hi David

We are assessing the repairs of the render to the Castle's west façade. It's the etback façade with metal ladderwork and gantry attached. (see photo attached)

Lab tests didn't confirm a cementitious render despite its apparent hardness. So we are considering the options for a suitable render repair recipe and wondered if you are aware of any information relating to this render work in the 1840s or thereabouts? Information that might indicate its constituent ingredients (lime, sand, pozzalans, additives etc) and their ratios (eg 3 sand to 1 lime to 1 crushed brick dust and aggregate fines)?

Photo 1261 shows one of two dummy windows that look like the adjacent real ones but are formed by painted render.

Please feel welcome to call if that helps in anyway at all. I look forward to hearing from you in due course.

Kind regards
Steve

Stephen Pitt-Francis
Associate Director
BROWNHILL HAYWARD BROWN
Chartered Architects

D | 01543 477595
E | sPitt-Francis@bhbarchitects.co.uk
W | www.bhbarchitects.co.uk
T | 01543 254357



Charlestown Workshops
2 Rocks Road
Charlestown
Fife
KY11 3EN
T: + 44 (0)1383 872722
F: + 44 (0)1383 872744



Page 2 of 6
XRD ANALYSIS REPORT
AP 3986
Sample 1

REPORT ON MORTAR ANALYSIS BY X-RAY DIFFRACTION (XRD)

AP 3986
Highclere Castle (West Front),
Highclere Park,
Newbury

Sample 1
Mortar

SITE	Highclere Castle (West Front), Highclere Park, Newbury
CLIENT	Brownhill Hayward Brown Ltd
DATE SAMPLE RECEIVED	22/06/2023
ANALYSIS DATES	22/06/2023 – 12/07/2023
ANALYSIS, INTERPRETATION & REPORT BY	Dr Katie Strang and Roz Artis
CLIENT REQUIREMENTS	Mortar Analysis by X-ray diffraction
STRUCTURE DATE	1839-42
STRUCTURE TYPE	Country Estate House
MORTAR DATING	Possibly original, c. 1840s
LOCATION/ FUNCTION IN BUILDING	Mortar from the west elevation, second floor. Sample taken from the moulded window reveal.
CONDITION OF SAMPLE RECEIVED	The sample received consisted of a bag containing intact pieces of mortar plus fines. Size of largest piece = 115.07mm x 65.38mm x 40.25mm Total mass of sample received = 145.71 grams

On the basis of the results from the XRD analysis, it is indicated that the mortar analysed may have been mixed from a non-hydraulic lime. There were no clinker components (e.g. belite and alite) or pozzolanic reaction products detected, which would have been expected for a hydraulic lime or cement. The presence of bassanite suggests the mortar has undergone some degree of sulphate attack due to water percolation through the mortar. The bassanite was present in relatively high amounts (18%) and if it is the result of sulphate attack, petrography would be required to understand the impact this secondary mineralisation is having on the microstructure and performance of the material. The XRD also identified lead minerals in the form hydrocerussite, indicating that the paint coating is lead-based. It must be considered that mortars are variable by nature, and clinker components may have fully hydrated, and analysis by petrography would be required to ascertain information on how the binder was made, the strength and the nature of the raw materials.

This mortar analysis report is NOT intended as a repair specification. Details of repair specifications based on information from this report should also take account of prevailing site conditions, including stone type and condition, location and function of the new mortar, building details, exposure, seasonal working etc.

Appendix - Scottish Lime Centre Trust Report: Render Sample Analysis by X-Ray Diffraction



Methods

The sample was to be submitted to analysis by X-ray Powder Diffraction to establish the crystalline components present, to ascertain the type of binder used. The sample was sent to the laboratory at The Concrete Technology Unit, University of Dundee, for XRD analysis and all interpretation carried out by Dr Katie Strang of SLCT.

The sample was to be submitted to analysis by X-ray Powder Diffraction to establish the crystalline components present, to ascertain the type of binder used. The sample was sent to the laboratory at The Concrete Technology Unit, University of Dundee, for XRD analysis and all interpretation carried out by Dr Katie Strang of SLCT. The sample was initially photographed on receipt in the laboratory, logged with its mass and size recorded prior to the sample being submitted to an examination with the aid of a stereo-binocular microscope at a magnification up to x20. During the examination the sample was exposed to a series of *ad hoc* droplet tests employing a range of reagents and indicator solutions to aid the identification of the components present and to assess the condition of the mortar.

Following the examination, a representative sub-sample was obtained to permit confirmation of the type of binder used in the mortar to be prepared, with this analysed by X-ray Diffraction (XRD). This was achieved by disaggregating the sample by gently grinding it in an agate mortar and pestle to separate the binder from the aggregates, with the binder recovered by sieving the materials over a 63µm sieve.

The prepared powdered sample was backpacked into a proprietary sample holder in preparation for presentation in the diffractometer, with the sample analysed in a Philips X-ray Diffractometer fitted with a single crystal monochromator, set to run over the range 3° to 60° 2θ in steps of 0.1° 2θ at a rate of 1° 2θ/minute using CuKα radiation. The digital output from the diffractometer was analysed by a computer program, which matched the peak positions against the JCPDS International Standard Mineral Data-base sub files using a search window of 0.1°.

The analysis results and interpretations made from it provide information on the composition and characteristics of the mortar sample(s) received by the SLCT laboratory. **Provided the sample was representative of the mortar generally**, the analysis will give a reasonable indication of the original materials and provide a **basis for specification** of repair mortars. If more detailed information is required (for example, for purposes of historic research) more sophisticated analytical procedures can be undertaken.



Mortar examination and analysis



Plate 1. Image showing the outer surface of the sample as received. Scale bar = 30mm.



Plate 2. Image showing the underside of the sample as received. The sample shows signs of leaching and binder dissolution. Scale bar = 20mm.

PROCEDURE	OBSERVATIONS
PRELIMINARY VISUAL ANALYSIS OF SAMPLE	The mortar appeared coherent and well compacted across the outer surface, however exhibited heavy soiling and signs of leaching on the inner surface. The sample is moderately firm, requiring moderate pressure to disrupt, but once disrupted it can be disaggregated and powdered further with ease. There were no obvious lime inclusions or coal/burnt fuel fragments noted in the sample. The mortar retained a paint coating on some surfaces. A phenolphthalein indicator test confirmed that the mortar was fully carbonated whilst a water droplet test confirmed that the mortar was porous as the droplets were absorbed and the water diffused throughout the mortar quickly.
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE (X40 MAGNIFICATION)	Once dried the mortar was found to be 10YR 8/2 'very pale brown' to 6/2 'light brownish grey' when assessed against the Munsell Soil Colour Charts. The surface of the intact pieces appeared granular in texture and exhibited heavy voiding. The voids and surface of the mortar showed linings of calcite and other secondary products, suggesting moisture percolation through the mortar. There was also patchy areas indicative of binder leaching. Water worn lithic fragments and quartz grains appear to make up the courser aggregate fractions. The finer fractions consist mainly of sub-angular to angular quartz grains.

Appendix - Scottish Lime Centre Trust Report: Render Sample Analysis by X-Ray Diffraction



Quantification by Rietveld Refinement

To assist in clarifying this further the results from the XRD analysis were processed by Rietveld refinement in the Maud Computer program, the results of which are presented below:

Component	% by mass
Calcite	61.2
Quartz	19.0
Bassanite	18.0
Hydrocerussite	1.6
Penninite	0.3
Total	100.0

The results of the analyses are shown in the following figure, in the form of a labelled X-ray diffractogram:

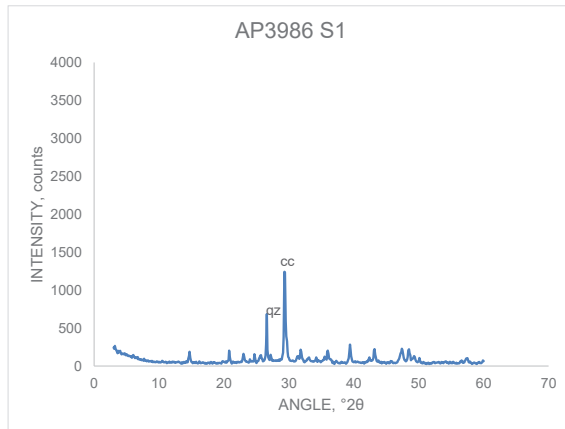


Figure No. 1: Mortar from Highclere Castle.



Comments

The abbreviations used on the chart, to identify peak positions, are as follows:

- cc** = Calcite (CaCO_3) calcium carbonate, carbonated binder from lime type binders
- qz** = Quartz (SiO_2) dominant component of the aggregate in the mortar
- ba** = Bassanite, calcium sulphate hydrate, base of gypsum plaster or reaction product
- pe** = Penninite, clay mineral, common aggregate component
- hy** = Hydrocerussite, lead mineral (white lead), common component of historic paints

On the basis of the results from the XRD analysis, it is indicated that the mortar analysed may have been mixed from a non-hydraulic lime. There were no clinker components (e.g. belite and alite) or pozzolanic reaction products detected, which would have been expected for a hydraulic lime or cement. The presence of bassanite suggests the mortar has undergone some degree of sulphate attack due to water percolation through the mortar. The bassanite was present in relatively high amounts (18%) and if it is the result of sulphate attack, petrography would be required to understand the impact this secondary mineralisation is having on the microstructure and performance of the material. The XRD also identified lead minerals in the form hydrocerussite, indicating that the paint coating is lead-based. It must be considered that mortars are variable by nature, and clinker components may have fully hydrated, and analysis by petrography would be required to ascertain information on how the binder was made, the strength and the nature of the raw materials.

bhb
architects

www.bhbarchitects.co.uk

Georgian House
24 Bird Street
Lichfield
WS13 6PT

01543 254 357
mail@bhbarchitects.co.uk