

Stabilisation Works at Ruperra Castle, Glamorganshire

Historic Buildings Record

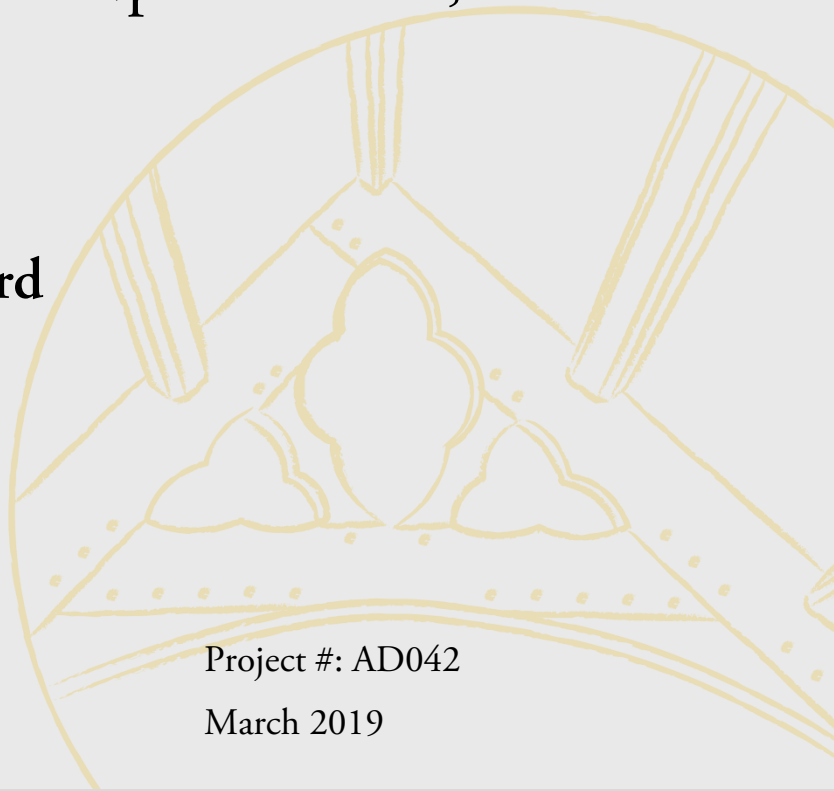
Ross Cook

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ArchaeoDomus
Archaeological & Heritage Services

3 Cysgod-y-Coed, Cwmann, Lampeter, Carm. SA48 8DN
01570 218048 / 07910 213557
ross.cook@archaeodomus.co.uk
www.archaeodomus.co.uk

Prepared for:

SAVE Britain's Heritage

70 Cowcross Street, Clerkenwell,
London, EC1M 6EJ

Project No:

By:

ArchaeoDomus Archaeological & Heritage Services
3 Cysgod-y-Coed, Cwmann, Lampeter, Carmarthenshire, SA48 8DN

Tel: +44 (0) 1570 218048 +44 (0) 7910 213557

Email: ross.cook@archaeodomus.co.uk

www.archaeodomus.co.uk

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This programme of archaeological work has been funded through a Cadw Ancient Monument Grant.

Abbreviations used in this report

RCAHMW	- Royal Commission on the Ancient and Historical Monuments Wales
HER	- Historic Environment Record.
LPA	- Local Planning Authority.
NGR	- National Grid Reference.
NMR	- National Monuments Record.
OS	- Ordnance Survey.

All other abbreviations will be referred to in text.

Project Team

Ross Cook - An experienced buildings archaeologist and surveyor with a background in archaeology and buildings conservation. He has undertaken archaeological fieldwork throughout Wales and has also worked to produce detailed surveys of a wide range of scheduled monument and Listed Buildings through Wales and England; this has included Neath Abbey, Llansteffan Castle, Tretower Castle, Cilgerran Castle, Newport Castle Pembrokeshire, Picton Castle, and Brymbo Ironworks. Ross is the Cathedral Archaeologist for St Davids Cathedral, Pembrokeshire. He previously worked for the Royal Commission on the Ancient and Historical Monuments of Wales as a Historic Buildings Investigator (Archaeology), where he recorded buildings and Monuments, and provided advice on historic buildings at a national level. Currently he is involved with project work with Cadw, The Brymbo Heritage Group, and The Buildings of Medieval and Ottoman Palestine Research Project.

Ross also works as an Associate Dendrochronologist with the Oxford Dendrochronology Laboratory, through which he has undertaken work on sites such as Hampton Court Palace, Winchester Cathedral, Queens House Greenwich, The Tower of London, Christ Church and Magdalen College Oxford, Llwyn Celyn (Mons), and a large number of other smaller listed buildings and scheduled sites throughout Wales and England.

ArchaeoDomus Archaeological & Heritage Services is the trading name of Ross Cook. An affiliate member of the CIfA, and adheres to the CIfA codes of conduct. He also holds a valid CSCS card.

Cert. in Buildings Archaeology - University of Sussex, CCE.

PGCert. Social Anthropology - University of Wales, Lampeter

BA Joint Honours Archaeology & Anthropology - University of Wales, Lampeter

Stabilisation Works at Ruperra Castle, Rudry, Glamorganshire

Historic Buildings Record

Summary

ArchaeoDomus Archaeological & Heritage Services was commissioned by SAVE Britain's Heritage to prepare a Written Scheme of Investigation, and undertake a Historic Buildings Record and Archaeological Watching Brief during stabilisation works to Ruperra Castle, Rudry. This programme of works, it is hoped, will build into a large project to secure the stability of the monument for future generations to enjoy.

Ruperra Castle was completed in 1626 at the bequest of Thomas Morgan, and remains as one of only two buildings of this architectural form in Wales. Its significance arises from being a rare example of the mock-castle form in both Wales and England and a renaissance house with both Elizabethan and Jacobian form.

The stabilisation works initially set out to stabilise the south elevation and porch. However, the instability of the south chimney and its risk of collapse, meant the project was altered to undertake the considerate dismantling of this structure. Stabilisation works were also undertaken to support the south window (above the porch). As a result, no works were undertaken to the south elevation or porch during this initial phase of the project.

Consent was granted on 2nd February 2017 by Cadw, the Welsh Government's historic environment service, under consent number DH and has been funded through a Cadw Ancient Monument Grant.

A Watching Brief was maintained during all works, and was undertaken 14th May to 5th June 2018 and oversaw all interventions to the monument. This allowed for a full and complete record to be made of the chimney prior to any works, during the dismantling process and upon completion. On completion of works to the south chimney, a watching brief was maintained during works to the south window (above the porch), during the insertion of rolled steel joists and insertion of supporting brickwork.

The drawn, photographic and written account of the watching brief are contained within this report.

[B L A N K P A G E]

1 INTRODUCTION

1.1 Project

- 1.1.1 ArchaeoDomus was commissioned by Graham Frecknall Architects to undertake a programme of archaeological buildings recording to Historic England Level 2 and Level 3 standard during the first phase of stabilisation works at Ruperra Castle (GM379), Glamorganshire, hereafter also referred to as 'the site' or 'monument'.
- 1.1.2 The programme of archaeological works has been paid for by a Scheduled Monument Grant from Cadw, the Welsh Government's historic environment service.
- 1.1.3 The programme of works was initially envisaged to have stabilised the south elevation including the porch. However, on commencement of works the southern chimney (*Fig. 8*) was observed to be in a particularly poor state of repair and posed a risk to anyone working beneath. The work programme was therefore altered to dismantle the chimney to a safe height to be shrouded.
- 1.1.4 This report forms the first phase of a proposed larger programme of works to the monument, however, no final plans have been developed at the time of this report.

1.2 Consent

- 1.2.1 Scheduled Monument Consent (ref. DH) was granted on 2nd February 2017 by Cadw, the Welsh Government's historic environment service, to undertake a programme of conservation works to stabilise the South Elevation of Ruperra Castle.
- 1.2.2 With consent Cadw, the determining body, applied a number of Archaeological Conditions, in line with national policy as set out in AMAA 1979, as amended by the Historic Environment (Wales) Act 2016, and Section 3 of the Well-being of Future Generations (Wales) Act 2015. The latter of which places a duty on Ministers to improve the economic, social, cultural, and environmental well-being of Wales, in line with section 4 of the same act. The Scheduled Monument Consent set out a number of conditions, which state:

Pre-works:...

(iii) a detailed archaeological specification [shall be received] for our written approval. This shall include details of the arrangements for buildings recording and archaeological excavation;

(iv) confirmation that a secure storage area to store materials (architectural features / artefacts) arising from the works has been identified and secured.

During works:...

(vi) at the start of the project the applicant shall arrange a start-up meeting to include the works contractors, appointed archaeological specialists and Cadw officials to review the SMC requirements including project scope, conservation methodology (including the materials to be used in the project), project timetable and monitoring arrangements;

Archaeological and recording requirements:...

(xi) that a suitably qualified archaeologist shall carry out recording of the historic fabric of the building and archaeological excavations where ground disturbance is required to facilitate the conservation and stabilisation works;

(xii) that the appointed archaeologist shall be responsible for undertaking excavation within the scheduled area to investigate and record any archaeological features exposed during the course of the works. No ground disturbance should take place other than under archaeological supervision;

(xiii) that the appointed archaeologist or other suitably qualified specialist shall record all the structural and architectural elements of the building affected by the conservation works prior to disturbance/removal;

(xiv) sufficient time shall be allowed to excavate and record in situ archaeology.

(xv) that in the event that unexpected and/or significant archaeological remains are exposed Cadw must be informed and, if requested by Cadw, work must cease until Cadw Inspectorate have had an opportunity to visit the site and assess the significance of the archaeological remains. It may then be necessary to review the proposed stabilisation methodology, in order to mitigate any adverse archaeological impact;

Completion:...

(xix) that within 6 weeks of completion of the project, you shall provide Cadw with a copy of the draft archaeological and building report to read and approve;

(xx) That within one month of the draft report having been approved the applicant will deposit a final version of the report, incorporating any comments/editorial amendments to:

Cadw – denise.harris@wales.gsi.gov.uk

The Regional Historic Environment Record held by Glamorgan Gwent Archaeological Trust – her@ggat.org.uk

The National Monument Record Wales (RCAHMW) -

Gareth.Edwards@rcahmw.gov.uk'

- 1.2.3 As Ruperra Castle is a scheduled monument, and therefore an archaeological site, the AMAA (Wales) Act 1979 required the any person authorised by the Secretary of State be given access to the site during the course of any works or interventions.

- 1.2.4 The fieldwork was commenced on 26th February 2018 and concluded on 5th June 2018, in accordance with the guidance given by the Chartered Institute for Archaeologists, *CIfA Standards and Guidance for the Archaeological Investigation and Recording of Standing Buildings* (December 2014), and Historic England's *Understanding Historic Buildings: A guide to good practice* (2016).
- 1.2.5 All fieldwork has been undertaken by a qualified archaeologist and in accordance with the standards and guidance as laid down by the Chartered Institute for Archaeologists.
- 1.2.6 This report documents the results of the Historic Buildings Record and programme of stabilisation works.

2 SITE LOCATION

- 2.1 Ruperra Castle, or Rhiwperra in Welsh, is located in Caerphilly County Borough Council, sitting on the eastern edge of Glamorganshire, near the boundary with Monmouthshire. The Monument is located along a small track; from the west it is accessible from Rudry Road, and the east from an unnamed road. The property is located within the community of Rudry, but sits within close proximity to the communities of Draethen (north), Cefn Mably (south), and Michaelston-y-Fedw (south-east). The M4 lies 3.2km to the south. To the east, south, and west the Monument is bounded by field systems with disbursed patches of woodland. With the north bounding onto Coed Craig Ruperra, a broadleaved woodland owned by the Ruperra Conservation Trust. Ruperra Castle sits at c. 117m above sea level at NGR ST 21979 86315.
- 2.2 The local bedrock is a Conglomerate and Subequal/Subordinate Sandstone known as Lanishen Conglomerate (BGS) with no superficial Quaternary deposits (BGS), and a soil layer of slightly acidic loamy and clayey soil with impeded drainage (Luvisols) (UKSO).

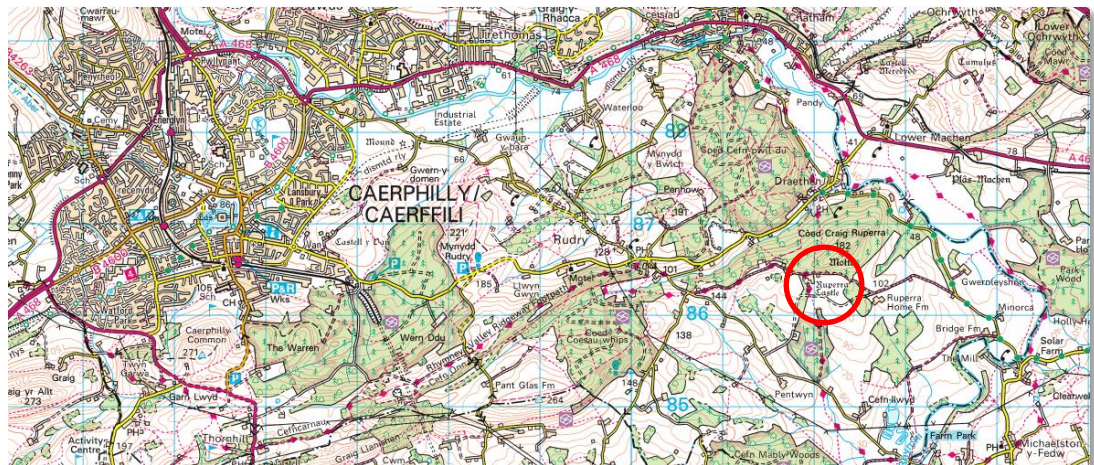


Fig. 1 – Location of the Ruperra.

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Fig. 2 – Location of Ruperra Castle.

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3 AIMS AND OBJECTIVES

3.1 Historic Buildings Record

- 3.1.1 The aim of the historic buildings record is to produce and document all material alterations and changes made to the monument during the course of this first phase of stabilisation works. As defined by the CIfA (2014: 3) as:

A programme of archaeological building investigation and recording will determine, as far as is reasonably possible, the nature of the archaeological resource associated with a specified building, structure or complex. It will draw on existing records (both archaeological and historical sources) and fieldwork. It will be undertaken using appropriate methods and practices which satisfy the stated aims of the project, and which comply with the Code of conduct, Code of approved practice for the regulation of contractual arrangements in archaeology, and other relevant by-laws of the CIfA. The programme will result in the production of drawings, an ordered accessible archive and a report'

- 3.2.2 Produce a descriptive and photographic record of the building prior to and during any alterations made to the building through the programme of stabilisation works.
- 3.2.3 Document any material changes to the building, particularly where any elements are to be dismantled to ensure their future reinstatement.
- 3.2.4 Supplement the descriptive and photographic record with accurate drawn records, where and as these are required.
- 3.2.5 The results of the investigation and report will aim:

'to seek a better understanding, compile a lasting record, analyse the findings/record, and then disseminate the results.' (CIfA 2014: 3)

3.2 Results

- 3.2.1 The objective of the historic buildings record is to produce a permanent record of the site and to place this within a public domain through deposition with the National Monuments Record of Wales, Regional HER and Cadw.

4 METHODOLOGY - HISTORIC BUILDINGS RECORDING

4.1 Introduction

- 4.1.1 All archaeological investigation has been conducted by a qualified archaeologist in accordance with the methodology set out in the Written Scheme of Investigation (ArchaeoDomus 2018) and in accordance with the Standards and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures (November 2014) as laid down by the Chartered Institute for Archaeologists.
- 4.1.2 On site methodology comprises of three elements:
- Photographic survey of the monument before, during and after works.
 - Measured survey before commencement of works.
 - Site notes and observations to create the written record.
- 4.1.3 All survey work of the chimney and hanging masonry was undertaken from a basket suspended by wire from a 55 tonne crane. All crane operations were undertaken by R. W. Christopher Crane Hire Ltd.
- 4.1.4 A full methodology for the recording and dismantling of the South Chimney implemented can be found in **Appendix 5**. The methodology was prepared by ArchaeoDomus and submitted to Cadw for approval prior to any work commencing on site. All dismantling and building work was undertaken by Wye Valley Demolition Ltd, under the direct supervision of ArchaeoDomus.

4.2 Measured Survey

- 4.2.1 A Level 2 record, in line with Historic England levels (2016), was undertaken to record the South Elevation of the monument prior to any physical intervention. This took the form of a digital metric survey, utilising a Leica TS06 Total Station to register survey points and distances for direct input via TheoLT into AutoCAD 2013.
- 4.2.2 A Level 3 record, in line with Historic England levels (2016), was undertaken to record the South Chimney prior to dismantling. Measurements were taken for each elevation of the chimney from a baseline below the require dismantling level; 6 inch external masonry nails were used to provide permanent markers. From this base line measurement were taken vertically to key marker points, with measurements taken in plan at key heights.
- 4.2.3 Photogrammetry has been used to add greater detail to both the South Elevation and South Chimney surveys. A Canon 760D with 24mm prime lens was used to capture high quality photographs, which were processed using AgiSoft Photoscan, with a total error of 60mm. Orthographic images were produced using CloudCompare, from which the final 2D record drawings were produced in AutoCAD 2013.

4.3 Photographic Survey

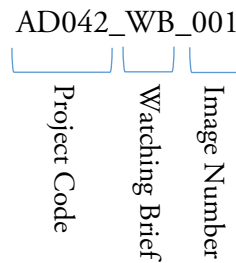
4.3.1 The photographic survey was undertaken with a Canon EOS 760D 24 megapixel digital camera, tripod mounted where possible, with a Canon EFS 18-50mm, and a 135mm telephoto lens. Due to the nature of the work, photo scales were not used.

4.3.2 A general photographic record was made of the building, which included:

- General views of the south elevation and its surroundings.
- Detail/features of specific building elements.
- Detailed record photography of the south chimney and hanging masonry areas.

4.3.3 The photographic record has been compiled into an archive, which has been appended to this report (**Appendix 2**).

4.3.4 The archive numbers attributed to the photographs have been given the references as follows:



4.4 Documentary Research

4.4.1 Documentary research was undertaken by Holland Heritage, which has been provided for inclusion as an appendices to this report. Further research has been undertaken using readily available resources, such as Coflein, RCAHMW publications and online mapping.

5 HISTORICAL BACKGROUND

5.1 Introduction

5.1.1 Please refer to Appendix I for the historical background of Ruperra Castle, supplied for use by Holland Heritage, who retains copyright. This is an extract from a draft Heritage Statement (2017) produced at the request of Mr and Mrs Al-Khafaji.

5.1.2 Ruperra Castle is a Scheduled Monument protected under the Ancient Monuments and Archaeological Areas Act 1979, as amended by the Historic Environment (Wales) Act 2016. It was designated on 2nd September 1976 under number **GM379**, for the following reasons;

‘Burnt out shell of house built by Sir Thomas Morgan of Ruperra, steward of the Earl of Pembroke. The south porch bears the date 1622. it stands adjacent to the existing house and consists of a square three storey block with circular towers at the four corners. The wall tops are battlemented and the whole structure is obviously a pseudo-castle. Peter Smith compares it with Lulworth Castle (of 1608) and Plas-Teg of 1610, all three being built by high officials.

The house is cement rendered externally, except for the tall and elegant mullioned windows with stepped heads (i.e. with the centrelight taller) and the fine ashlar porch with shell niches, cornice, and armorial panel. The internal structure survives, but a crack in the south-east tower, cutting across a window opening gives cause for concern.’ (2/9/76 JKK)

5.1.3 The Monument is also a Grade II* Listed Building (**ID 14069; Appendix NUMBER**), and is registered in the National Monuments Record Wales under **NPRN 19900**, and with the Regional HER under **PRN 02451m**.

5.1.4 The Monument was recorded by the Royal Commission on the Ancient and Historical Monuments of Wales and presented in their 1980 publication *Glamorgan Vol 4 Part 1 - The Greater Houses* (262-268). Along with a historical and descriptive record of the monument, the record presents a ground floor plan, detail of the armorial panel and doorways, and a reconstruction of the house as it would have been during the 18th century.

5.2 Designated and Undesignated Sites

5.2.1 Ruperra Castle sits at the centre of an estate once covering some 3,000 acres (1,200 hectares). At the core of the former estate there are a number of listed buildings and scheduled monuments, a number with a direct relationship to the monument. The heritage assets range in date from the prehistoric to 19th century

5.2.2 Heritage assets associated with Ruperra Castle:

- ❖ **Ruperra Hillfort and Motte** - SM - GM551 - ST 22335 86698
- ❖ **Ruperra Castle Lower Summerhouse Remains** - SM - GM590 - ST 22374 86650
- ❖ **Former Dairy and Laundry** - Grade II - ID 18972 - ST 21975 86362

- ❖ **Stable and Coach-house Courtyard Ranges** - Grade II - ID 18971 - ST 21958 86403
- ❖ **Generating House and Attached Workshop** - Grade II - ID 18973 - ST 21916 86421
- ❖ **Glasshouse** - Grade II - ID 20144 - ST 22010 86410
- ❖ **Summerhouse** - Grade II - ID 20145 - ST 22093 86431
- ❖ **Castellated Boundary Wall to Ha-Ha** - Grade II - ID 20146 - ST 22095 86375
- ❖ **New Mansion** - Grade II - ID 84994 - ST 23050 86386

5.3 Cartographic

- 5.3.1 Cartographic sources were consulted for this work, but as they do not relate detail covered by this report, licences have not been sought for their inclusion.

6 RECORD OF INTERVENTIONS

6.1 Introduction

- 6.1.1 This section provides a breakdown of interventions made during the first phase of stabilisation works at Ruperra Castle and will provide an account of each stage of operations.
- 6.1.2 Initially the programme at Ruperra Castle had sought to undertake stabilisation works to the entirety of the South Elevation, including the south porch. Wye Valley Demolition were contracted to undertake high level works to stabilise the mock battlements and insert support to the window above the south porch. Sally Strachey Historic Conservation were contracted to undertake conservation works to the dressed and carved stonework of the south porch, but the latter element of works did not proceed due to restricted funds at this stage.
- 6.1.3 During the initial inspections of the building, the south chimney was observed to be in poor condition, posing risk of collapse. Recommendations from the appointed engineer, Richard Dean, was to dismantle the chimney so that it did not pose a risk to anyone working to the south elevation.
- 6.1.4 Physical interventions to the monument took place between 14th May and 5th June 2018. All interventions to the monument were undertaken from a basket suspended from a crane.
- 6.1.5 The crane was supplied by R. W. Christopher Crane Hire Ltd, and operated by Russell Christopher, Brian Girdwood and Liam Blow.

6.2 Event Timeline

- | | |
|---|---|
| ❖ <i>23rd February 2018:</i> | Initial site meeting. |
| ❖ <i>26th - 27th February 2018:</i> | Measured survey commencement. |
| ❖ <i>23rd March 2018:</i> | Photographic survey and ground pressure test. |
| ❖ <i>25th - 30th April 2018:</i> | Temporary trackway laid for crane access. |
| ❖ <i>8th May 2018:</i> | Crane arrives on site and initial inspections made. |
| ❖ <i>14th - 22nd May 2018:</i> | Recording and dismantling of south chimney. |
| ❖ <i>23rd May - 5th June 2018:</i> | Insertion of masonry to support hanging masonry to window above south porch and removal of tree/shrub growth. |
| ❖ <i>5th June 2018:</i> | Final inspections of completed works. |

6.3 Pre-Works Survey

- 6.3.1 Prior to all works commencing on site, on 26th to 27th February 2018, an initial digital measured survey and photographic record (for photogrammetry) was undertaken of the South Elevation. A full photographic record for archival purposes was undertaken of the South Elevation was undertaken on 23rd March 2018.

6.3.2 Survey control, in the form of ground-spike (x3) were left on site to enable future surveys to use the same control network. However, on returning to site in May, all three ground-spikes were no longer *in-situ* as a result of ground clearances and laid trackway.

6.4 South Chimney

6.4.1 On 8th May 2018 the south chimney was inspected by Richard Dean (engineer), Jonathan Berry (Cadw), and Andrew Howell (Wye Valley) and was found to be in a very poor condition and at risk of collapse. The decision was made, to enable works to progress safely to the south elevation, that the chimney should be dismantled.

6.4.2 A 150mm crack was observed between flues 1 and 2 to the north of the chimney (**Plate 13, 039; Fig. 7, 8**), the result of which caused this element of the chimney to begin to fall away and a large bulge to appear, due to twisting, to the top of the east face (**Plate 34**). The southern flue (number 5) of the chimney had already partially collapsed (**Plate 03**).

6.4.3 Initially the decision was taken to dismantle the chimney by *circa* 4 metres, which was later reviewed and the decision taken to reduce in height to the top of the brick courses.

6.4.4 The south chimney was recorded and dismantled between 14th and 22nd May 2018 under constant archaeological supervision and in-line with the *Method for Recording and Dismantling Masonry* (ArchaeoDomus 2018).

6.4.5 The chimney was recorded through noted observation, measured survey and photography before any physical interventions were made to the monument. Full photographic coverage of the chimney was undertaken, whereby 700 photographs were taken from all angles, to produce a photogrammetric model from which the final record drawing was produced (**Fig.**).

6.4.6 A datum was chosen below the lowest course of masonry to be dismantled and all vertical measurements were made from these. Datum points were set at the top of brick courses:

- ❖ **North Elevation:** 42 - D7 and 41 - D8
- ❖ **East Elevation:** 42 - D5 and D6
- ❖ **South Elevation:** 37 - D3 and D4
- ❖ **West Elevation:** 41 - D1 and 42 - D2

6.4.7 Sketch plans were made on site for the creation of a masonry log to allow dismantling work to begin immediately. All masonry recording was undertaken to enable the identification of the course in which any stone/brick was laid, the original position within that course, and its presented face. Each course was given a number and stone/brick code (I.e. 1A, 1B) before any dismantling took place; if any single piece of stone was faced on more than one elevation, a compass point was given to the corresponding elevation (3A-E and 3A-W). Flues are numbered 1 to 5, from north to south.

- 6.4.8 Stones were marked using **white** acrylic paint to their top surfaces as they were uncovered by removal of the layers above; only facing bricks/stone ashlar and capstones were coded, fill material was not recorded by course. However, due to the nature of the works and risk of collapse, some stones were marked on their faces prior to dismantling to allow for collection and identification at a later stage in the project, should they fall.
- 6.4.9 All dismantling work was undertaken from the basket and undertaken by Philip Moore (builder; Wye Valley), with a labourer to support. During dismantling all care was taken to remove each item of masonry without damage, using pry-bars and bolsters to ease blocks away from bedding mortar. As all dismantling works were undertaken from a basket suspended from the crane, only two operatives were allowed in the basket during this process; this work was monitored by the archaeologist from the ground.
- 6.4.10 On removal and unloading to the ground each course was arranged on pallets in order, with no more than one course to a pallet. The pallets were then numbered and noted on an inventory register, before being wrapped in packing plastic.
- 6.4.11 During the dismantling works, rows 4 and 5 were brought to ground as large cement encased pieces of sandstone, with no form or shape clearly visible. At ground level the cement was carefully removed from the sandstone and showed these to be the original octagonal flue stones. Although in poor condition, these were palletised and recorded as part of the inventory.
- 6.4.12 After each complete layer was removed, the archaeologist inspected the progress of works to make notes and record the chimney photographically, taking additional measurements in plan when required. Measured plans were made at each significant change in courses, i.e. at each material change.
- 6.4.13 During the dismantling process it became clear that it was not possible to dismantle/break apart the cement lining to the flues. On consultation with Jonathan Berry (Cadw), it was agreed that these could be lifted off in complete sections after the dismantling of the stone ashlar had been completed.
- 6.4.14 As a result of the unstable nature of the masonry a small number of ashlar were lost through disintegration or through falling. These items are as follows:
- | | | |
|---|-----|------------------|
| ❖ | 4AA | - Disintegrated? |
| ❖ | 6F | - Fallen |
| ❖ | 6G | - Fallen |
| ❖ | 7G | - Disintegrated? |
- 6.4.15 On removal of all stone courses, the chimney stack was inspected at the first brick course by the engineer for stability and integrity. The chimney stack was deemed to be stable and no longer at risk of collapse, with recommendation for netting and scaffold brace to be placed over the chimney to further support its stability.
- 6.4.16 All dressed stonework was retained and palletised, along with the ironwork and cast concrete flue cap supports. The fill material was of broken brick held with a modern cement mortar was removed and emptied into tonne lift bags. Samples of the different mortars were collected and have been retained by ArchaeoDomus for future analysis. These are detailed in the table below.

Sample Number	Location	Description
AD042_MS_001	South Chimney	Mortar to course 5. Taken from AA/AB/AC/AD/AE
AD042_MS_002	South Chimney	Flue stone bedding concrete. Below course 3 above course 4.
AD042_MS_003	South Chimney	Mortar to red brick flue (2) at row 5.
AD042_MS_004	South Window	Stone coursing mortar, upper. East end of window.
AD042_MS_005	South Window	Stone coursing mortar, lower. East end of window.

6.4.17 The pallets are to be store securely on site until further assessment and rebuilding.

6.5 South Window

6.5.1 On 22nd and 24th May, the hanging masonry was inspected by Richard Dean (engineer), Jonathan Berry (Cadw) and Andrew Howell (Wye Valley) and areas to be removed for the insertion of rolled steel joists were marked.

6.5.2 The masonry below the window (**Plate 125**) had fallen away at 45° after the 1942 fire had caused the loss of the original timber bressummer supporting this and, as a result, has left the sandstone window hanging precariously. The decision was taken that this should be supported with new brickwork built of rolled steel joists, bedded into the original beam sockets. The rolled steel joists were coded from north to south, with **GRD1** being the northern most, **GRD2** the middle, and **GRD3** the southern.

6.5.3 Work to support the hanging masonry was begun on 23rd May 2018. The initial preparation for the work required the removal of several pieces of undressed masonry, which was overseen by Jonathan Berry (Cadw). These were removed and stored on a pallet for storage and later reuse. The rolled steel joists were then lifted into place and numbers **GRD2** and **GRD3** were bedded into place using a lime mortar.

6.5.4 All bedding and brickwork was bonded using a NHL 3.5 hydraulic lime at a mix ratio of 1:3, and applied to dampened stone/brick and covered in wet Hessian to control curing. The supporting masonry was built up using reclaimed brick, which are of a different colour and origin to all other bricks on site, to make the insertion clear and obvious. English bond was decided to be the most suitable as it enabled the most secure bonding of each skin to the next. Philip Moore (Wye Valley) was the builder responsible for all insertion and support works.

6.5.5 The window and hanging masonry were then recorded through noted observation, measured survey and photography before any further physical interventions were made to the monument.

- 6.5.6 During the bedding of the rolled steel joists, the last (**GRD1**) required the removal of additional masonry at the west end to enable it to bed correctly. All masonry was recorded photographically before removal.
- 6.5.7 To minimise any movement before the removal of masonry, a double skin of brickwork was built up to support the masonry above, should any any movement result from the intervention. Wet hessian was hung over the new masonry to stop the lime mortar from drying rapidly and to aid the curing process. On completion of the double brick skin, original stone masonry was carefully removed and **GRD1** moved into position and bedded in, with packing to level and support the masonry above. To ensure secure placement, the three steel joists were bolted together.
- 6.5.8 With the third steel joist in place, three further skins of brickwork were laid to complete the supporting masonry. The new masonry was sprayed thoroughly with water and covered in damp hessian.
- 6.5.9 Work was completed on 5th June 2018.

6.6 Tree Removal

- 6.6.1 As part of the conservation efforts, all accessible rooted trees were cut down, leaving their roots in situ.
- 6.6.2 Any other growth deemed detrimental to the monument was also removed.

7 HISTORIC BUILDINGS RECORD

7.1 Introduction

- 7.1.1 The historic buildings record was undertaken between the 26th February and 5th June 2018, 2018 and comprised of a visual inspection, measured survey and photographic record.
- 7.1.2 This historic buildings record will not be seeking to interpret and understand the full extent of Ruperra Castle, but will focus on the areas affected by stabilisation works between 14th May and 5th June 2018. However, it will provide a general overview of the monument's form and appearance
- 7.1.3 Ruperra Castle was built by Thomas Morgan in 1626 in a mock castle style, and it is from this period that the greater part of the monument dates. The building was devastated by fire in 1942 and has since been in a ruinous state. The principal elevations are built largely of limestone, with sandstone window and door jambs, and some brick fill. The external elevations are rendered in roughcast concrete, with all sandstone jambs left exposed.
- 7.1.4 The scope of the historic buildings record is to provide a written, drawn and photographic account of the buildings to Level 2 and Level 3 standard as specified by Historic England in *Understanding Historic Buildings; A guide to good practice* (2016).
- 7.1.5 A Historic Buildings Record to a Historic England Level 2 standard is the general level applied to this report, with the view to being incorporated into a final report at a later stage of the project at Ruperra Castle. This record fulfils the requirement to document the interventions undertaken and to provide a descriptive account.
- 7.1.6 The Level 3 element of this report applies to the South Chimney only. It is to serve as a lasting account of the chimney prior to dismantling and as guidance for its future rebuilding.
- 7.1.7 The drawn record is available in **Appendix I** and the photographic in **Appendix II**.

7.2 Plan

- 7.2.1 Ruperra Castle is a four-storey mock castle of a central square block with a round tower to each corner.
- 7.2.2 The building is constructed on a north-south alignment, determined by its principal elevation facing south, from which the sandstone porch projects.
- 7.2.3 The basement of the building sits at ground level to the north and west elevations, whilst the east and south sits below ground level. The ground floor sits above ground level to the north and west elevations.
- 7.2.4 The four towers are accessed at all levels from the central block.
- 7.2.5 Four large chimney stacks, each measuring approximately 4m x 1m, carry flues to 21 fireplaces in the central block, one stack to each compass point. To the towers there are 4 separate flues and 1

double to the north-west; 4 flues to the north-east; 3 surviving to the south-east; and 5 to the south-west.

7.3 Elevations

- 7.3.1 The **South Elevation**, also being the principal façade, is formed of the central block flanked by towers to the east and west ends, with a projecting three storeyed porch to the centre of the elevations. The elevation, similarly to the three others, is essentially formed of five bays of windows between the towers.
- 7.3.2 The eastern tower has suffered a partial collapse with the outer third having succumbed to the elements and flawed design, exacerbated by fire and exposure.
- 7.3.3 A small hollow moulded plinth forms the base of the elevation, and runs out at the western edge of the west tower. The plinth to the porch runs at a slightly lower level than that of the rest of the elevation.
- 7.3.4 A beaked-cavetto moulded string course runs to the top of the first floor, which rises over the windows to form hood moulding.
- 7.3.5 The elevation is finished in a cement render, with the exception of the sandstone of the windows and the porch, which have been left exposed.
- 7.3.6 The walls of the elevation rise into mock battlements, with both the crenels and merlons finished in copings of dressed sandstone.

7.4 South Porch

- 7.4.1 The porch is formed of finely cut and dressed sandstone ashlar with decorative stone panel and armorial panel.
- 7.4.2 A single semi-circular arched doorway sits to the centre of the porch at ground floor, flanked by a scallop headed niche to either side. The stone jambs to the doorway are decorated with ovolo moulding, which rise to a pendanted keystone, of which has been severely weather damaged.
- 7.4.3 The stone impost to the doorway begin strapwork, which frames the top of the niches and runs to the sides of the porch front.
- 7.4.4 Between ground and first floor runs a decorative course of dentils with strapwork frieze and finished with a hood of cyma reversa and cavetto moulding; to the eastern and western edges of this panel are two heraldic achievements under broken two-centred arches, the western is that of Herbert, Earl of Pembroke, intersected at its apex by a small wyvern, the eastern is of Rhys ap Tewdwr Mawr has lost its detail. Surmounting the panel are the Royal Arms, sitting between two Ionic columns and topped by dentils and a broken pediment with central acroterion.
- 7.4.5 At first floor is a single stone mullion step-headed three-light window, a beak moulded string course runs to the top of the first floor, which rises over the stepped head to form a hood.

- 7.4.6 From the string the porch rises to a course of panelled stonework, above which is a fluted blocking course, which support the cornice.
- 7.4.7 The balcony is formed of a course of ovolo moulded dressed stone to the base, rising to bottle balusters and pedestals to the corners, finished with a moulded stone hand rail.
- 7.4.8 The side elevations of the porch share the first-floor string in common with the south elevation and each has a window at first floor level.
- 7.4.9 The side elevations are rendered in common with the rest of the elevation.

7.5 Central Block Elevation

- 7.5.1 The central block is formed of five bays of fenestrated windows between the two towers.
- 7.5.2 The elevation of the central square block has two sandstone mullioned, step-headed, three-light windows to both sides of the porch at each floor level and a single window above the porch at third floor.
- 7.5.3 The windows are formed of sandstone mullions with cavetto moulding and rise into a three-centred arched head, with the central light rising above the adjoining, and are finished with plainly decorated sunken spandrels, and sitting recessed within an ogee moulded surround, all of which are topped by a beak moulded hood. All windows have grooves to support glazing, with some having the lead surviving.
- 7.5.4 At ground level a basement window can be seen to the west of the porch sitting in a brick lined lightwell.

7.6 Tower Elevations

- 7.6.1 The towers flank the central block and continue the same design form.
- 7.6.2 The eastern tower has suffered a partial collapse, cracking and dividing along the stress-line vertically between the three windows.
- 7.6.3 The windows are of a sandstone mullion two-light design without a stepped-head.
- 7.6.4 The window mullions are cavetto moulded and rise into a three-centred arched window head and are finished with plainly decorated spandrels, which are finished with a beak moulded hood.
- 7.6.5 The towers, unlike the central block, rise to a minor parapet and are set on the same string that is similarly moulded to the string at the top of the second floor.

7.7 South Chimney (Plate 01-119; Fig. 8-9)

- 7.7.1 The south chimney provides 5 flues to the southern-central rooms and chambers of the main square block of Ruperra Castle.
- 7.7.2 It is one of four surrounding the central core to the building, all of which are of the same form.
- 7.7.3 Its construction is largely of red brick, rising to dressed sandstone ashlar, with sandstone string course, above which a course of dressed sandstone blocks is topped with a course largely of cement coated sandstone. The stack is finished with limestone flue and cap stones, the latter supported on mud-cast concrete blocks.
- 7.7.4 There are 2 limestone, 1 cast concrete, 5 sandstone and 41 (max) red brick courses to the datum.
- 7.7.5 The sandstone ashlar are both square and rectangular in shape with an unusual square recessed face detail.
- 7.7.6 The limestone flue caps are both square and rectangular in shape and have holes bored to their centres, which is likely to enable hoist winching.
- 7.7.7 The southern-most flue is largely of a white brick and a later addition. The top of this flue has collapsed, but appears to have been finished in a mix of sandstone and brick.
- 7.7.8 The chimney has been built using predominantly a lime mortar, with cementitious mortar used in later alterations, patching and pointing.
- 7.7.9 The north elevation (**Plate 28-032**) of the chimney has a small band of cement bonding at 1.25m from the datum, signifying the presence of lead flashings.
- 7.7.10 The east elevation (**Plate 33-055**) of the chimney has a number of features relating to different phases of roof development made evident by the remains of lead flashings and a run of bricks indicative of an earlier, lower roofline. The earlier roofline runs at a pitch of 50°, though its full extents are not known. The later roofline is pitched at 35° and rises from 1.28m to 2.86m above datum (D6). The south end of the elevation is predominantly of white bricks, to provide an additional flue at first floor level. Below the datum lime dubbing and scratch coats remain at the first-floor level. A large crack runs 3.7m from the flue stone down to 0.24m above datum (D6).
- 7.7.11 The south elevation (**Plate 56-059**) of the chimney is formed entirely of white brick, with the top c. 1.5m succumbed to collapse, probably as a result of being poorly tied in to the original chimney, along with fire damage. This elevation is the only to step out by a brick course, and does so at 0.29m above the datum.
- 7.7.12 The west elevation (**Plate 08-027**) of the chimney is where the cause of instability to the chimney is most apparent; multiple phases of brick infill and alterations are clear. A roofline is made clear by the remaining cement pointing and lead flashings, which is pitched at 35° and rises from 1.21m to 2.94m above datum (D1). A vertical line of grazing to the earlier brickwork and immediately above a stone wall, demonstrates the likely existence of a wall running perpendicular to the chimney and is related of the same phase as the later roofline as it rises to a single course below this. The south end of the chimney is formed of the white brick used to create the new fireplace seen immediately below. A large crack runs from the top of the chimney to 0.14m above datum (D1), a second starts at 0.91m above datum (D1) and runs below the datum.

7.7.13 Brick sizes were recorded and have been summarised in the table below in inches.

Brick	Length	Width	Height
Red Brick (C17th)	9"	4¼"	2"
Red Brick (Modern)	9"	4"	3"
White Brick	9"	4"	2½"

7.7.14 Measurements were taken of the mortar widths across all faces of the chimney, which have been summarised in the table below.

Material	Min.	Max.	Average
Red Brick (C17th)	8mm	12mm	10mm
Red Brick (Modern)	5mm	10mm	7.5mm
White Brick	5mm	7mm	6mm
Ashlar Stone	8mm	10mm	9mm

7.7.15 The 4 original flues are lined with an applied 19th century cementitious mortar.

7.7.16 The South Chimney is in the same form as the three other chimney stacks to the central block, all of which belong to the initial phase of construction and vary only in their alterations.

8 DATING AND ANALYSIS

8.1 Introduction

- 8.1.1 *This analysis is not to present conclusions for the entirety of Ruperra Castle's development, but is instead to interpret and understand the information gathered from the interventions undertaken during this programme of works.
- 8.1.2 The larger part of this section will be concerned with the southern chimney, where the focus of this first phase of works was ultimately focused.
- 8.1.3 At this stage, phases have been related to the works observed to the South Chimney and will need to be considered at a later stage in project works at Ruperra Castle to reflect new findings within the rest of the monument.

8.2 South Chimney

- 8.2.1 The construction of the south chimney, although it is clear that there have been a number of minor interventions, can be summarised into three main phases:
- ❖ **Phase I - 1626:** Red brick chimney breast constructed, surmounted by 2 courses of dressed sandstone ashlar with sandstone cornice, from which octagonal sandstone chimney stack then rise.
 - ❖ **Phase II - 1780:** Fire damage sees a new roof constructed, with higher ridge-line replacing the Renaissance gabling.
 - ❖ **Phase III - 19th Century:** Iron cowls replace earlier stacks.
 - ❖ **Phase IV - 1910-1914:** Iron cowls dismantled and replaced with limestone flue stone, mud-cast concrete supports and limestone flue caps. Cement used to coat bottom two courses of octagonal stack to support new flue stones. New flue added to south end of the chimney at this time for fireplace to first floor.
 - ❖ **Other Interventions:** A number of other minor interventions have been made to the chimney, which relate to repair works and alteration/insertion of the exiting flues and patching repairs.
- 8.2.2 A full record of the chimney can be seen in **Appendix I** and **Appendix II**.

8.3 Phase I

- 8.3.1 The south chimney forms part of the initial phase of Ruperra Castle's construction, the red brick being characteristic in size (9 x 4 x 2 inches) and form for this period. The source of the bricks is not currently known.
- 8.3.2 The chimney appears to survive intact to the cornice, now string, of this phase of construction, in common with the other three. Each chimney rises in red brick and is finished by two rows of sandstone ashlar with square detailing to the face rising to a cornice (Row 6), although their top courses of masonry differ.
- 8.3.3 The sandstone ashlar blocks (rows 7-8), which appear to be of the same source as the porch and windows, are this primary phase, with little evidence to suggest otherwise. The unusual recessed square face detail is likely to have been ornamentation for this upper section of the stack.
- 8.3.4 Recovered from rows 4 and 5 during the dismantling works are sandstone blocks for the original octagonal upper stack stones (Plate 97-099), although poorly preserved due to encasement in cement mortar. A drawing from 1770 (Fig. 3) by an unknown artist, and an engraving of 1815 (Fig. 4) appear to support this.
- 8.3.5 If the physical evidence is to be believed, Ruperra indeed had octagonal chimneys. For 1626 they are somewhat archaic, though of a superior quality and workmanship. Other known examples in Glamorganshire dating to the 15th and 16th centuries; Glebe Farm, Cheriton; Garn-llwyd, Llancarfan, but no other contemporary examples have been found to date. They are an interesting aspect of the deliberate introduction of archaic architectural detail at Ruperra.
- 8.3.6 The source of the sandstone is not currently known and is not a local product. This importation to site alludes to the wealth and status of the Morgan family at the time of Ruperra's construction.
- 8.3.7 The chimney retains evidence of the 1626 roof pitch (Plate 54; Fig. 7) to the east elevation. This area of brick, made apparent by its protrusion from the face of the brickwork, runs at a pitch of 50°. A sketch of circa 1770 by an unknown artist (Fig. 3) confirms this earlier roof form and shows Ruperra as a Renaissance house of Elizabethan and Jacobean styling.



Fig. 3 - Ruperra Castle, 1780.
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8.3.8 The main breast and stack are of a common rectangular form, and can be seen at both Plas Teg and Lulworth Castle for direct comparison. To illustrate the standard form of the main breast and stack, similar examples can be seen at St Fagans Castle (c.1580-1596) Tredegar House (1666-72), Ewenny Priory House (Georgian rebuilding - 1803-5) and demonstrate the universality of a form determined by practical function.

8.4 Phase II - circa 1783

8.4.1 During the 1780s, Ruperra underwent works which sees the formation of a new roof and creation of the mock-battlements. The cause of rebuilding is, without question, related to the fire of 1783. It is unclear whether the chimneys were altered at this time, but an engraving of 1815 (Fig. 4), suggests that the originals may have survived the fire.

8.4.2 Unfortunately, both early images of Ruperra Castle do not show the chimneys in great detail, but do make the new roof formation very clear. The original roofs ran at right angles to the elevations, whereas that of the 1780s is formed as a hipped roof running parallel to the principal elevation; a far more contemporary style for the late 18th century.



Fig. 4 – Ruperra Castle, 1780.

8.4.3 This roofline remained until the fire of 1942 and is clearly visible on the east and west elevations by the remains of lead flashings and cementitious coating (Plate 17, 042).

8.4.4 Grazing to the west elevation of the chimney (Plate 12) demonstrates the existence of an abutting wall and provides evidence to suggest the floor plan, at least at the second floor, was rearranged at this time.

8.5 Phase III - 19th Century

- 8.5.1 Although physical evidence of this phase has been difficult to identify, evidence from photographs from 1907 and 1910 (Fig. 5 and 6) show the chimneys topped with long iron cowls.



Fig. 5 – Ruperra Castle, 1907.

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Fig. 6 – Ruperra Castle, 1910.

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- 8.5.2 This evidence leads to the probability that original octagonal stacks were removed and the chimney reformed sometime during the 19th century.
- 8.5.3 The cornice appears to have been retained to form a string course to the newly squared upper stacks, from which the new cowls rise. As part of this new stack alteration, it is likely within this phase that the upper flues were lined in concrete at this time.

8.6 Phase IV - 1910-1930

- 8.6.1 During this phase the chimney stacks were altered for the final time, removing the iron cowls and replacing them with a cowl arrangement of limestone flue stones and caps, on cast concrete supports. Photographic evidence from a postcard dated 1930 (**Fig. 7**) and an Aerofilm oblique, again of 1930, shows this new arrangement. At this time the chimney was repaired with a hard-cementitious mortar, applied to the face of courses 4 and 5.



Fig. 7 – Ruperra Castle, 1907.

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8.7 Other Interventions

- 8.7.1 A number of other interventions to the chimney are apparent through the patchwork of brick, most notably to the south and western elevation.
- 8.7.2 The most notable intervention is the addition of the flue number 5, made apparent by the white brick used in its construction to the south end of the chimney.
- 8.7.3 The west elevation has undergone a number of interventions and repairs. Several large areas of 19th/20th century red brick fill the chimney's west elevation (**Plate 12**); although the reason for this is not completely clear, it is likely a result of the repair or reorganisation of flues. A small patch of yellow brick (**Plate 15**), to bottom of the 1783 roof pitch, is another patch repair and is possibly associated with the replacement of deteriorated brickwork. Several pieces of limestone have been used to fill small areas of deteriorated brickwork (**Plate 42**).

8.8 South Window

- 8.8.1 The South Window appears to be largely of a single phase of construction, relating to the initial build of 1626 (**Phase I**) and retains the same stylistic form of the other windows in the central

block. However, it is possible that the window may have been reset during the course of works post-fire in *circa* 1783 (**Phase II**). The central light of the window appears to have served as a doorway, allowing access to a balcony atop the south porch.

9 DISCUSSION

- 9.1 From the evidence uncovered during the works to the South Chimney, it is clear that the structure has undergone four main phases of work, with a number of smaller interventions. This has resulted in three different forms of stack ornamenting the roofline.
- 9.2 The two main comparators to Ruperra are Plas Teg, Flintshire and Lulworth Castle, Dorset. These houses are architecturally of the same mock-castle form, with a central blocks cornered by towers. The plan and form being more Jacobean than Elizabethan; this is to say that they are planned from the outside in to retain a symmetrical façade, rather than the focus of the Elizabethan first being the internal arrangement of rooms. Plas Teg and Lulworth are earlier houses, being of 1608 and 1610 respectively, and like Ruperra are built by high officials of the Courts of Elizabeth I and James I. The later building of Ruperra in the same style is suggestive of Thomas Morgan making a concerted attempt, in stone, to mark his status alongside other courtiers.
- 9.3 The original form of the chimney stack in 1626, with its octagonal shaft, is somewhat archaic in form at the time of completion. It has been difficult to draw comparisons without looking to the 16th century and earlier in both Wales and England. Smaller houses certainly do continue the octagonal form into the 17th and 18th centuries, but these then fall short of being comparable in size and status to Ruperra, so offer little interpretive value. However, the use of the octagonal upper stacks and mock-castle form, are suggestive of an attempt to claim ancestry and legitimacy for the upwardly mobile Morgan family; Thomas Morgan served as Steward of the Household to Henry, second Earl of Pembroke and Lord of Glamorgan, and was knighted for his service in 1623. This new social status prompted the complete rebuilding of the original house at Ruperra to fit this status and solidify his legitimacy as Sir Thomas, using older architectural forms to support this claim. The Glamorganshire Hearth Tax Assessment of 1670, shows Ruperra assessed as having 48 hearths, making it the largest house in the county and some 16 hearths larger than Margam, and 18 than St Donats (Parkinson, 1994: xxxiii). Though a two years later it is assessed at 42 hearths, which either represents the house only being in partial use, or the earlier included an additional building. Either way, these numbers are a clear sign of the rise of Thomas Morgan and the wealth that it allowed him to accumulate.
- 9.4 Despite being out-dated in form by 1626, the octagonal stacks are of superior construction to others of this period and should be viewed as a fine example of stone masonry and design.
- 9.5 The form of the four large chimneys to the central block are of a common rectangular form as seen in many country houses and manors; a large rectangular breast rising into ornamented upper stacks. Ruperra, as with Plas Teg and Lulworth, share this same form, which arises from a functional requirement to carry flues from multiple fireplaces. Each carries the main breast up to a cornice, before the upper-stacks rise. It is unlikely that each of the houses retains their original upper-stacks, so a full conclusion of the original form of each is not attainable. Early sketches of each property do not present adequate detail of the chimneys to ascertain their form and later engravings date from the 18th century, whereby the first rebuilding in each instance is likely to have already taken place. Yet, in their later formation, each has a squared top to the stack, defined by a cornice, string or ornamental stonework.

- 9.6 Of the four chimney stacks, the south and west stacks are the most damaged and suggest that the fire in 1942 largely effected the south-western corner of the house. The north and east chimneys survive in good condition.
- 9.7 The South Window appears to be a survival of the original phase of construction by Thomas Morgan. Its form sets it apart from the other windows in the elevation as the central light appears to have once been a doorway for entrance to a balcony atop the south porch.

10 RECOMMENDATIONS

10.1 Survey

- 10.1.1 Before any further works are undertaken to the monument, a laser scan survey at all levels would provide a full and comprehensive record prior to any further alterations. This would not only provide a dataset and framework for the archaeology to be recorded in, but also for the architect and engineer to undertake design or calculation works.
- 10.1.2 Scanning to a resolution of <3mm is recommended to allow for the largest amount of detail to be captured and would provide a record of the monument at a single moment in time.

10.2 Dendrochronology

- 10.2.1 All timber surviving *in-situ* should be subjected to dendrochronological dating to ascertain to which time period it belongs, therefore supporting the record of historical interventions to the monument. If ring-width dendrochronology fails to date, other forms of dating should be considered, i.e. dendro-isotope dating.

10.3 Mortar Analysis

- 10.3.1 As the mortars form an integral part of the monument, attempts should be made to identify and test mortars from different phases of works to identify their chemical composition. This can help with phasing and with the design phases of works.

10.4 Material Identification

- 10.4.1 The current source of sandstone at Ruperra is currently unknown. The nature of the works to Ruperra will require the replacement of whole, and elements of, existing architectural stonework. This identification would allow for faithful replacements to be worked for their inclusion into the monument.
- 10.4.2 Bricks are difficult to provenance, as a result of the processing of the brick earth and addition of inclusions. Efforts should therefore be made to identify the composition of the bricks so that any future replacements are in-keeping with those used during the construction of the monument.

11 ARCHIVING

- 11.1 The results of the Historic Buildings Record is this written report, interpreted survey, and photographic archive. This will be held by ArchaeoDomus Archaeological & Heritage Services and will be deposited with the regional HER, NMRW and Cadw. A PDF copy of the report will be made available from www.archaeodomus.co.uk.
- 11.2 The project archive will comprise all field notes and documents, photography, finds, associated reports, and drawings. The archive will be compiled and deposited following The National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales 2017.
- 11.3 ArchaeoDomus shall retain the copyright of any commissioned reports, tender documents, plans and photographs, under the Copyright, Designs and Patent Act 1988, with all rights reserved, excepting that a licence is granted to the client for the use of such documents by the client in all matters directly relating to the project.

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www.ukso.org.uk

12.2.4 Britain from Above

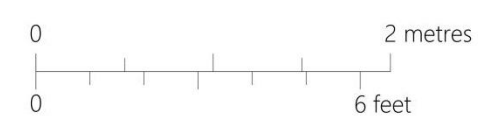
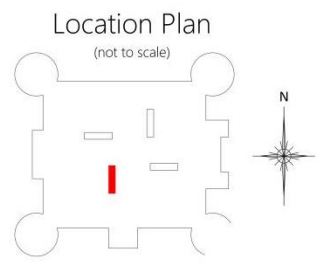
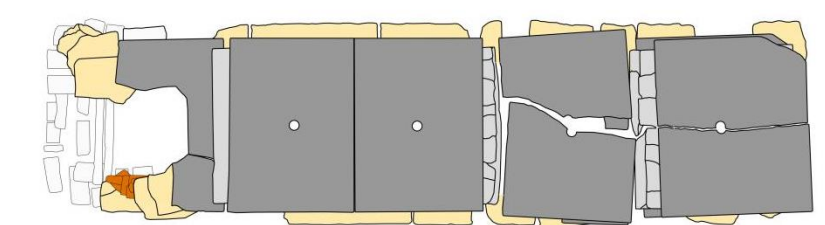
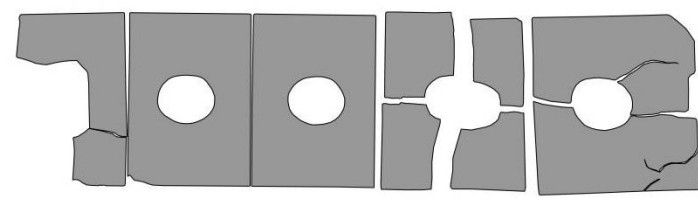
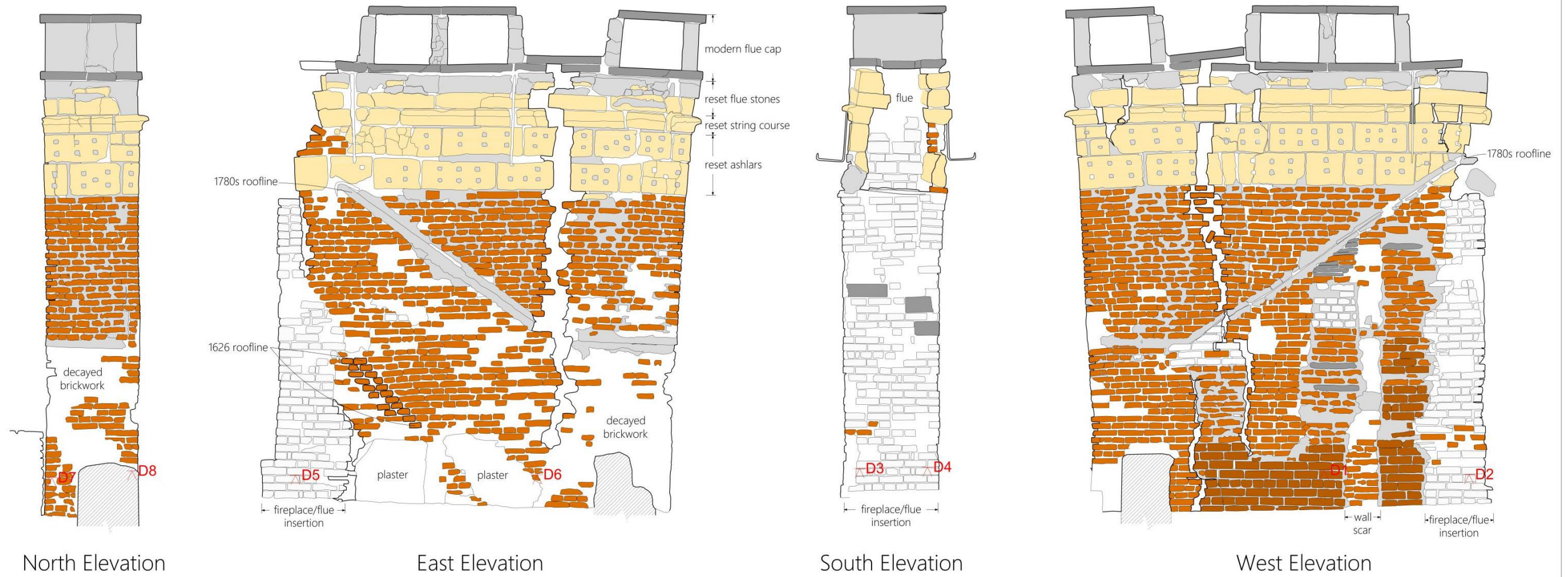
Accessed: August 2018

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APPENDIX I

Drawn Record

South Chimney, Ruperra Castle



- Red Brick - 1626
- Sandstone - 1626
- White Brick - c. 1910 - 1930
- Cementitious Material - c. 1910 - 1930
- Limestone - c. 1910 - 1930
- Red Brick - c. 1910 - 1930

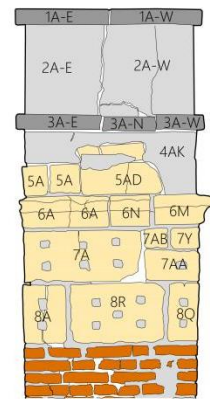
Project Archaeological Record of The South Chimney, Ruperra Castle.			
Drawing Title Elevations as Existing			
National Grid Ref. ST 21973 86314	Surveyor Ross Cook	Drawn Ross Cook	
Drawing No. AD042-1	Revision -	Scale 1:20 @ A1	Date Aug. 2018

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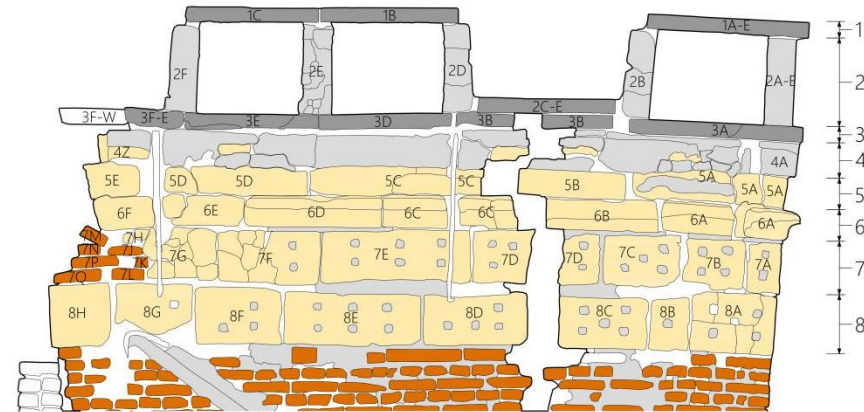
3 Cynod-y-Coed, Cwmann, Lampeter, Carmarthenshire, SA48 8DN
Tel: 01570 218048 / 07910 213557 Email: ross.cook@archaeodomus.co.uk
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Fig. 8 – South Chimney Elevations as Existing

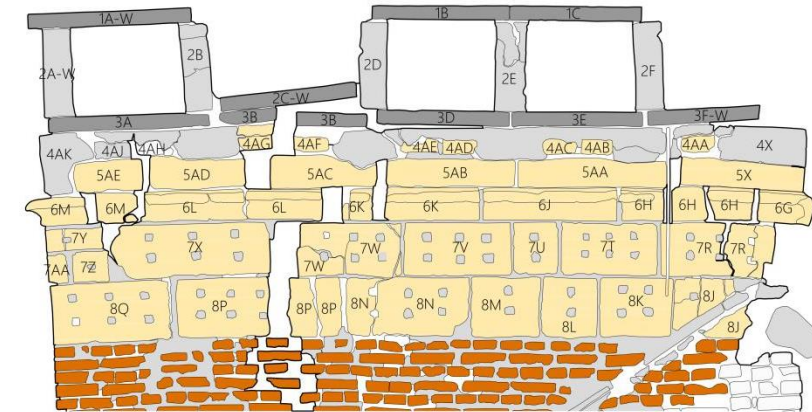
South Chimney, Ruperra Castle



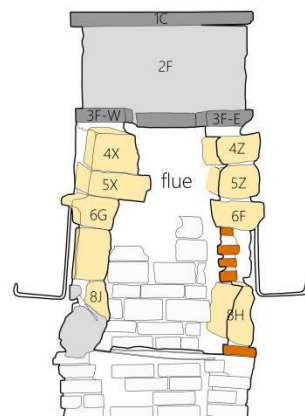
North Elevation



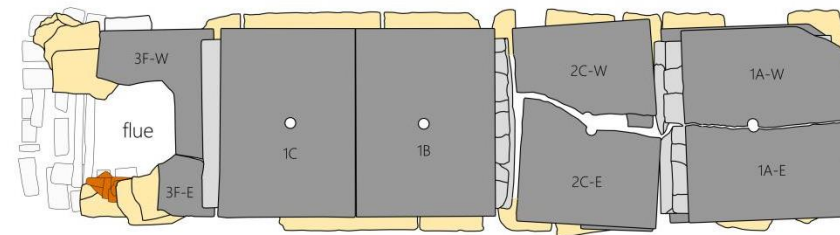
East Elevation



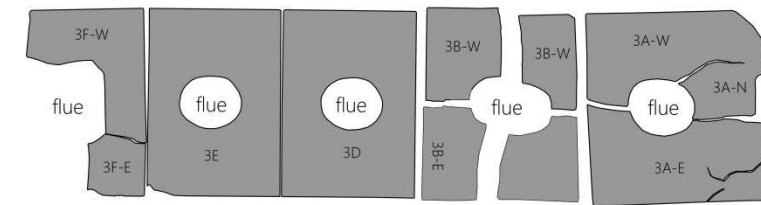
West Elevation



South Elevation

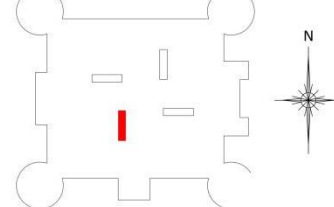


Plan



Flue Plan

Location Plan
(not to scale)



- Red Brick - 1624
- Sandstone - 1624
- White Brick - C19th?
- Cementitious Material - c. 1930
- Limestone - c. 1930
- Red Brick - c. 1930

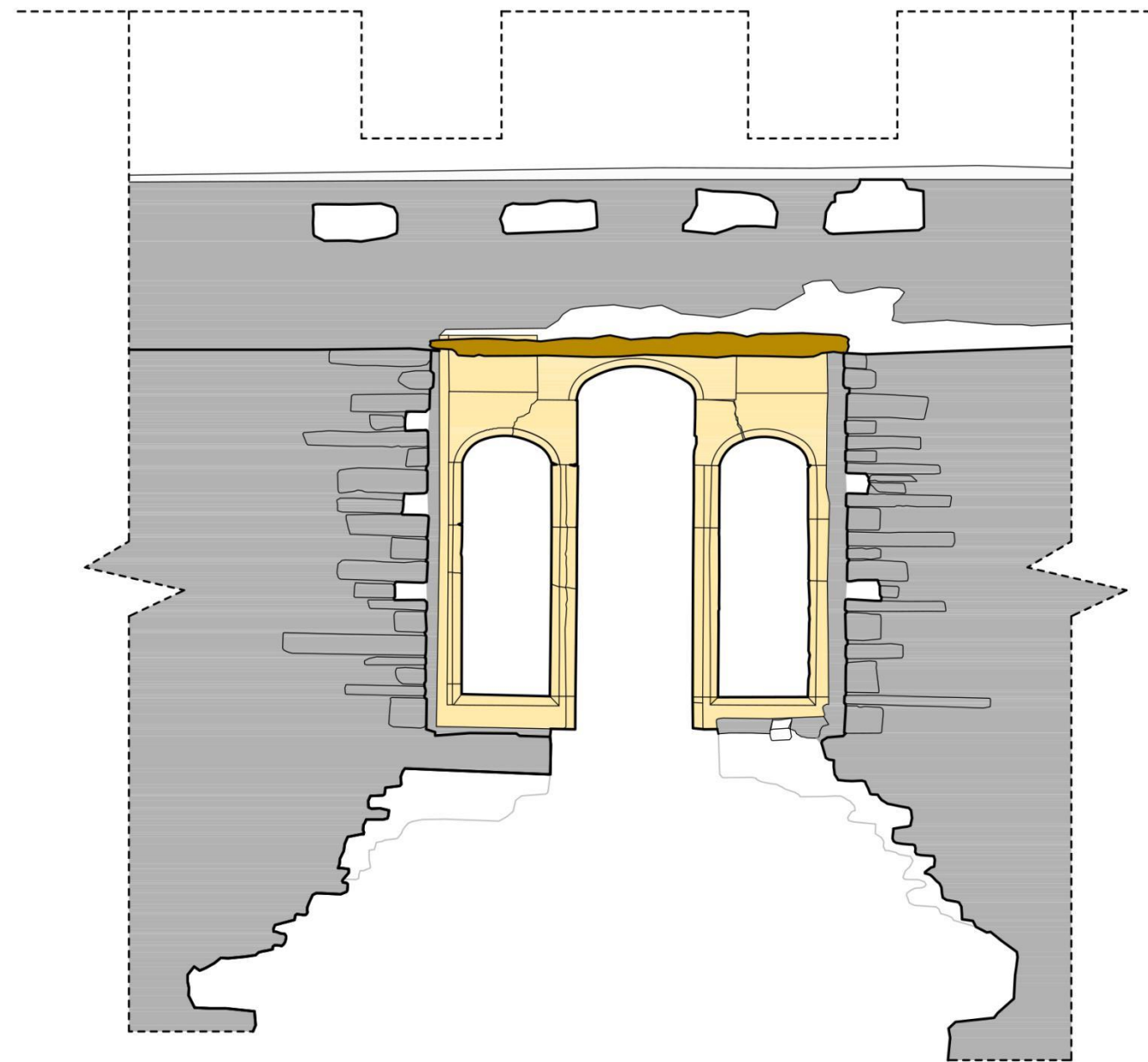
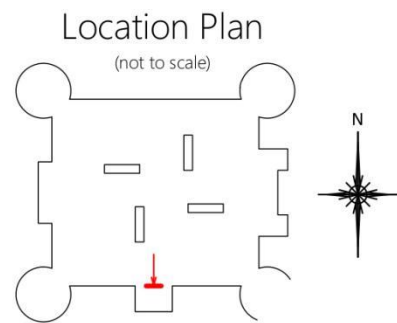
Project Archaeological Record of The South Chimney, Ruperra Castle.			
Drawing Title Numbered Masonry Plan			
National Grid Ref. ST 21973 86314	Surveyor Ross Cook	Drawn Ross Cook	
Drawing No. AD042-2	Revision -	Scale 1:20 @ A1	Date Aug. 2018

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 Tel: 01570 218048 / 07910 213557 Email: ross.cook@archaeodomus.co.uk
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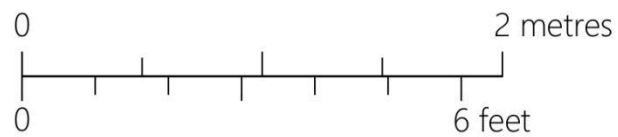
Fig. 9 – South Chimney Numbered Masonry Plan.

South Window, Ruperra Castle

- Limestone - 1626
- Sandstone - 1626
- White Brick - c. 1910 - 1930
- Timber - Unknown Date



Internal Elevation



Project Archaeological Record of the South Window, Ruperra Castle.		
Drawing Title Internal Elevations as Existing		
National Grid Ref. ST 21973 863 14	Surveyor Ross Cook	Drawn Ross Cook
Drawing No. AD042-3	Revision -	Scale 1:20 @ A4
		Date Sept. 2018

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3 Cysgod-y-Coed, Cwmarn, Lampeter, Carmarthenshire, SA48 8DN
Tel: 01570 218048 / 07910 213557 Email: ross.cook@archaeodomus.co.uk
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Fig. 10 – South Window Internal Elevation.

APPENDIX II

Photographic Register

Photographic Archive

South Chimney

South Window

Camera	Canon 760D					
Lenses	Canon EF-S 18-55mm Lens					
Number	Description	Viewpoint	Direction	View Angle	Dir - B/W	Flash
AD042_WB_001	South Chimney - 3/4 view showing south and west chimney elevations.		N-E	N	C	N
AD042_WB_002	South Chimney - 3/4 view showing chimney in relation to north, east and west chimneys.		N-E	N	C	N
AD042_WB_003	South Chimney - South chimney elevation, showing top of flue, caused by partial collapse of brickwork.		N	N	C	N
AD042_WB_004	South Chimney - South chimney elevation.		N	N	C	N
AD042_WB_005	South Chimney - West chimney elevation, showing capstones and sandstone coursing.		N-E	N	C	N
AD042_WB_006	South Chimney - West chimney elevation, showing string course.		N-E	N	C	N
AD042_WB_007	South Chimney - 3/4 view showing South and West elevations.		N-E	N	C	N
AD042_WB_008	South Chimney - West elevation, showing damaged sandstone ashlar.		E	N	C	N
AD042_WB_009	South Chimney - West elevation, showing iron hook/strap.		E	N	C	N
AD042_WB_010	South Chimney - West elevation, showing line of lead flashing.		E	N	C	N
AD042_WB_011	South Chimney - West elevation, showing lead flashing and limestone and later brick patch-repair.		E	N	C	N
AD042_WB_012	South Chimney - West elevation, showing full visible extent.		E	N	C	N
AD042_WB_013	South Chimney - West elevation, showing initial area to be dismantled (to blue line).		E	N	C	N
AD042_WB_014	South Chimney - West elevation, showing later inserted/added brickwork (white brick) for additional fireplace and flue; and former wall scar.		E	N	C	N

AD042_WB_015	South Chimney - West elevation, showing crack, caused by northern flue falling away.	E	N	C	N
AD042_WB_016	South Chimney - West elevation, showing crack, caused by northern flue falling away.	E	N	C	N
AD042_WB_017	South Chimney - West elevation, showing lead flashing to former roofline.	E	N	C	N
AD042_WB_018	South Chimney - West elevation, showing 20 th century red brickwork and wall scar.	E	N	C	N
AD042_WB_019	South Chimney - West elevation, showing crack to sandstone ashlar opening through to east elevation.	E	N	C	N
AD042_WB_020	South Chimney - West elevation, showing capstones and flue stones, with cast concrete uprights.	E	N	C	N
AD042_WB_021	South Chimney - West elevation, showing capstones and flue stones, with cast concrete uprights.	E	N	C	N
AD042_WB_022	South Chimney - West elevation, showing sandstone and concrete fill to north-west corner.	E	N	C	N
AD042_WB_023	South Chimney - West elevation, showing dropped capstone.	E	N	C	N
AD042_WB_024	South Chimney - West elevation, showing capstone and cast concrete uprights.	E	N	C	N
AD042_WB_025	South Chimney - West elevation, showing pinch spalling.	E	N	C	N
AD042_WB_026	South Chimney - Showing relationship to East chimney.	E	N	C	N
AD042_WB_027	South Chimney - West elevation, showing fall of the north flue from plumb.	E	N	C	N
AD042_WB_028	South Chimney - North elevation, showing cementitious mortar fill.	S	N	C	N
AD042_WB_029	South Chimney - North elevation, showing string course profile.	S	N	C	N
AD042_WB_030	South Chimney - North elevation, showing string course.	S	N	C	N

AD042_WB_031	South Chimney - North elevation, showing decayed sandstone ashlar with cementitious mortar above.	S	N	C	N
AD042_WB_032	South Chimney - North elevation, showing capstone, cast concrete uprights and flue stone.	S	N	C	N
AD042_WB_033	South Chimney - East elevation, showing evidence of mud-casting to concrete upright.	S-W	N	C	N
AD042_WB_034	South Chimney - 3/4 view of north and east elevations, showing string course.	S-W	N	C	N
AD042_WB_035	South Chimney - East elevation, showing iron hook/strap.	S	N	C	N
AD042_WB_036	South Chimney - 3/4 view of north and east elevations, showing pinch spalling and flashing line to former roof.	S-W	N	C	N
AD042_WB_037	South Chimney - East elevation, showing cap stones to flues 1 and 2.	W	N	C	N
AD042_WB_038	South Chimney - East elevation, showing cap stones to flues 3 and 4.	W	N	C	N
AD042_WB_039	South Chimney - East elevation, showing visible extents.	W	N	C	N
AD042_WB_040	South Chimney - East elevation.	W	N	C	N
AD042_WB_041	South Chimney - East elevation, showing 1626 roofline, patches of lime plaster, crack and later inserted flue (white brick).	W	N	C	N
AD042_WB_042	South Chimney - East elevation, showing inserted flue (5; white brick).	W	N	C	N
AD042_WB_043	South Chimney - East elevation, showing crack.	W	N	C	N
AD042_WB_044	South Chimney - East elevation, showing capstones to sandstone ashlar coursing.	W	N	C	N
AD042_WB_045	South Chimney - East elevation, showing remaining evidence of 1626 roofline.	W	N	C	N
AD042_WB_046	South Chimney - East elevation, showing 1626 roofline and surviving lime plasterwork.	W	N	C	N
AD042_WB_047	South Chimney - East elevation, showing crack and flashing line to 1783 roof.	N-W	N	C	N

AD042_WB_048	South Chimney - East elevation, showing iron hook/strap.	W	N	C	N
AD042_WB_049	South Chimney - East elevation, showing collapsing masonry and later lead flashing to 1783 roofline.	W	N	C	N
AD042_WB_050	South Chimney - East elevation, showing brickwork supporting upper masonry to south end of east elevation.	W	N	C	N
AD042_WB_051	South Chimney - East elevation, showing latter flue (5) addition in white brick. East elevation, showing surviving lime plaster.	W	N	C	N
AD042_WB_052	South Chimney - East elevation, showing surviving lime plaster.	N-W	N	C	N
AD042_WB_053	South Chimney - East elevation, showing later flue brickwork in white.	W	N	C	N
AD042_WB_054	South Chimney - East elevation, showing 1626 roofline.	W	N	C	N
AD042_WB_055	South Chimney - East elevation, showing surviving plasterwork scratch and float coat.	W	N	C	N
AD042_WB_056	South Chimney - South elevation, showing flue 5.	N-W	N	C	N
AD042_WB_057	South Chimney - South elevation, showing iron support to former 3 rd floor fireplace.	N-W	N	C	N
AD042_WB_058	South Chimney - South elevation, showing numbering to limestone flue cap.	N	N	C	N
AD042_WB_059	South Chimney - South elevation, showing former first floor fireplace.	N-E	N	C	N
AD042_WB_060	South Chimney - Chimney after removal of rows 1 and 2, showing flue stones.	N	N	C	N
AD042_WB_061	South Chimney - Chimney after removal of rows 1 and 2, showing flue stones.	N	N	C	N
AD042_WB_062	South Chimney - Chimney after removal of rows 1 and 2, showing flue stones.	E	N	C	N
AD042_WB_063	South Chimney - Chimney after removal of rows 1 and 2, showing flue stones 1 and 2.	E	N	C	N
AD042_WB_064	South Chimney - Chimney after removal of rows 1 and 2, showing flue stones 3 and 4.	E	N	C	N

AD042_WB_065	South Chimney - Chimney after removal of rows 1 and 2, showing flue stones 4 and 5.	E	N	C	N
AD042_WB_066	South Chimney - Chimney after removal of rows 1 and 2, showing flue stones 4 and 5.	N-E	N	C	N
AD042_WB_067	South Chimney - Chimney after removal of row 3.	E	N	C	N
AD042_WB_068	South Chimney - Chimney after removal of row 4.	N-E	N	C	N
AD042_WB_069	South Chimney - Chimney after removal of row 4, showing flue 2.	E	N	C	N
AD042_WB_070	South Chimney - Chimney after removal of row 4, showing flue 2.	E	N	C	N
AD042_WB_071	South Chimney - Chimney after removal of row 4.	N	N	C	N
AD042_WB_072	South Chimney - Chimney after removal of row 4.	N-W	N	C	N
AD042_WB_073	South Chimney - View showing chimney in relation to north, east and west chimneys.	N-W	N	C	N
AD042_WB_074	South Chimney - Chimney after removal of row 5.	N-E	N	C	N
AD042_WB_075	South Chimney - Chimney after removal of row 5.	W	N	C	N
AD042_WB_076	South Chimney - Chimney after removal of row 6.	N	N	C	N
AD042_WB_077	South Chimney - Chimney after removal of row 6.	N-E	N	C	N
AD042_WB_078	South Chimney - Chimney after removal of row 6.	E	N	C	N
AD042_WB_079	South Chimney - Chimney after removal of row 7 and partial row 8.	E	N	C	N
AD042_WB_080	South Chimney - Chimney after removal of row 7, showing north cementitious mortar lined flue 1.	S-W	N	C	N
AD042_WB_081	South Chimney - Chimney after removal of row 7.	S-W	N	C	N
AD042_WB_082	South Chimney - Chimney after removal of row 7.	W	N	C	N
AD042_WB_083	South Chimney - Chimney after removal of row 7, showing flues 1, 2 and 3.	W	N	C	N
AD042_WB_084	South Chimney - View showing chimney in relation to north, east and west chimneys.	N-W	N	C	N
AD042_WB_085	South Chimney - View showing chimney in relation to north, east and west chimneys.	N-W	N	C	N
AD042_WB_086	South Chimney - Pallet 1	-	N	C	N

AD042_WB_087	South Chimney - Pallet 2	-	N	C	N
AD042_WB_088	South Chimney - Pallet 3	-	N	C	N
AD042_WB_089	South Chimney - Pallet 4	-	N	C	N
AD042_WB_090	South Chimney - Pallet 5	-	N	C	N
AD042_WB_091	South Chimney - Pallet 6	-	N	C	N
AD042_WB_092	South Chimney - Pallet 7	-	N	C	N
AD042_WB_093	South Chimney - Pallet 8	-	N	C	N
AD042_WB_094	South Chimney - Pallet 9	-	N	C	N
AD042_WB_095	South Chimney - Pallet 10	-	N	C	N
AD042_WB_096	South Chimney - Pallet 11	-	N	C	N
AD042_WB_097	South Chimney - Pallet 12	-	N	C	N
AD042_WB_098	South Chimney - Pallet 12, showing base of octagonal stack.	-	N	C	N
AD042_WB_099	South Chimney - Pallet 13	-	N	C	N
AD042_WB_100	South Chimney - Pallet 14	-	N	C	N
AD042_WB_101	South Chimney - Pallet 15	-	N	C	N
AD042_WB_102	South Chimney - Pallet 15	-	N	C	N
AD042_WB_103	South Chimney - Pallet 16	-	N	C	N
AD042_WB_104	South Chimney - Pallet 16	-	N	C	N
AD042_WB_105	South Chimney - Pallet 17	-	N	C	N
AD042_WB_106	South Chimney - Pallet 19	-	N	C	N
AD042_WB_107	South Chimney - Pallet 18	-	N	C	N
AD042_WB_108	South Chimney - Pallet 20	-	N	C	N
AD042_WB_109	South Chimney - Pallet 20	-	N	C	N
AD042_WB_110	South Chimney - Pallet 21	-	N	C	N
AD042_WB_111	South Chimney - General view of palletised masonry.	-	N	C	N
AD042_WB_112	South Chimney - Chimney after removal of row 8.	E	N	C	N
AD042_WB_113	South Chimney - Chimney after removal of row 8, showing flues 3 to 5.	S	N	C	N

AD042_WB_114	South Chimney - Chimney after removal of row 8, showing flues 1 and 2.	E	N	C	N
AD042_WB_115	South Chimney - Chimney after removal of row 8, showing flue 2 and area of lost brickwork.	W	N	C	N
AD042_WB_116	South Chimney - Chimney after removal of row 8.	S	N	C	N
AD042_WB_117	South Chimney - Chimney after removal of row 8.	N	N	C	N
AD042_WB_118	South Chimney - Chimney after removal of row 8.	W	N	C	N
AD042_WB_119	South Chimney - Chimney after removal of row 8.	N-E	N	C	N
AD042_WB_120	South Window - South window exterior, showing surviving brass casement to sandstone window.	N	N	C	N
AD042_WB_121	South Window - South window exterior, showing rolled steel joists (RSJ).	N	N	C	N
AD042_WB_122	South Window - South window exterior, showing window heads and hood mould.	N	N	C	N
AD042_WB_123	South Window - South window exterior, showing sills and fallen masonry.	N	N	C	N
AD042_WB_124	South Window - South window exterior.	N	N	C	N
AD042_WB_125	South Window - South window interior.	S	N	C	N
AD042_WB_126	South Window - South window interior, showing RSJs.	S	N	C	N
AD042_WB_127	South Window - South window interior, showing RSJ pad.	S	N	C	N
AD042_WB_128	South Window - South window interior, showing RSJ pad.	S	N	C	N
AD042_WB_129	South Window - South window interior, showing hanging masonry.	S	N	C	N
AD042_WB_130	South Window - South window interior, showing deteriorating sandstone window head, east.	S	N	C	N
AD042_WB_131	South Window - South window interior, showing showing deteriorated sandstone window head, west.	S	N	C	N
AD042_WB_132	South Window - South window interior, showing RJS temporary siting.	S	N	C	N

AD042_WB_133	South Window - South window interior, showing RSJ temporary siting.	S	N	C	N
AD042_WB_134	South Window - South window interior, showing surviving timber lintel.	S	N	C	N
AD042_WB_135	South Window - South window interior, showing wall masonry section, east.	E	N	C	N
AD042_WB_136	South Window - South window interior, showing temporary RSJ siting and masonry to be removed.	W	N	C	N
AD042_WB_137	South Window - South window, showing wall masonry cross section, west.	W	N	C	N
AD042_WB_138	South Window - South window, showing temporary RSJ siting and masonry to be removed.	W	N	C	N
AD042_WB_139	South Window - South window, showing temporary RSJ siting and masonry to be removed.	E	N	C	N
AD042_WB_140	South Window - South window, showing temporary RSJ siting and masonry to be removed.	S	N	C	N
AD042_WB_141	South Window - South window, showing temporary RSJ siting and masonry to be removed.	W	N	C	N
AD042_WB_142	South Window - South window interior, showing hanging masonry.	S	N	C	N
AD042_WB_143	South Window - South window, showing GRD1 - interior.	S	N	C	N
AD042_WB_144	South Window - South window, showing GRD2 - middle.	S	N	C	N
AD042_WB_145	South Window - South window, showing GRD3, exterior.	S	N	C	N
AD042_WB_146	South Window - South window, showing lead fixing joint, west.	S-W	N	C	N
AD042_WB_147	South Window - South window, showing lead fixing joint, west.	S-E	N	C	N
AD042_WB_148	South Window - South window, showing glazing bar socket, east.	E	N	C	N
AD042_WB_149	South Window - South window, showing glazing bar socket, west.	W	N	C	N

AD042_WB_150	South Window - South window, showing hollow mould of mullion, east.	N-E	N	C	N
AD042_WB_151	South Window - South window, showing showing hollow mould of mullion, west.	N-W	N	C	N
AD042_WB_152	South Window - South window, showing window head with glazing lead, west.	N	N	C	N
AD042_WB_153	South Window - South window, showing hood moulding.	N	N	C	N
AD042_WB_154	South Window - South window, showing window head with glazing lead, east.	N	N	C	N
AD042_WB_155	South Window - South window, showing start of supporting brickwork.	N	N	C	N
AD042_WB_156	South Window - South window, showing supporting brickwork complete to exterior.	N	N	C	N
AD042_WB_157	South Window - South window, showing supporting brickwork exterior skin, inner face.	S	N	C	N
AD042_WB_158	South Window - South window, showing supporting brickwork complete to interior.	S	N	C	N
AD042_WB_159	South Window - South window, showing supporting brickwork complete to exterior.	N	N	C	N



Plate 1 - AD042_WB_001 - 3/4 view showing south and west chimney elevations.



Plate 2 - AD042_WB_002 - 3/4 view showing chimney in relation to north, east and west chimneys.



Plate 3 - AD042_WB_003 - South chimney elevation, showing top of flue, caused by partial collapse of brickwork.



Plate 4 - AD042_WB_004 - South chimney elevation.



Plate 5 - AD042_WB_005 - West chimney elevation, showing capstones and sandstone coursing.



Plate 6 - AD042_WB_006 - West chimney elevation, showing string course.



Plate 7 - AD042_WB_007 - 3/4 view showing South and West elevations.



Plate 8 - AD042_WB_008 - West elevation, showing damaged sandstone ashlar.



Plate 9 - AD042_WB_009 - West elevation, showing iron hook/strap.



Plate 10 - AD042_WB_010 - West elevation, showing line of lead flashing.



Plate 11 - AD042_WB_011 - West elevation, showing lead flashing and limestone and later brick patch-repair.



Plate 12 - AD042_WB_012 - West elevation, showing full visible extent.



Plate 13 - AD042_WB_013 - West elevation, showing initial area to be dismantled (to blue line).



Plate 14 - AD042_WB_014 - West elevation, showing later inserted/added brickwork (white brick) for additional fireplace and flue; and former wall scar.



Plate 15 - AD042_WB_015 - West elevation, showing crack, caused by northern flue falling away.



Plate 16 - AD042_WB_016 - West elevation, showing crack, caused by northern flue falling away.



Plate 17 - AD042_WB_017 - West elevation, showing lead flashing to former roofline.



Plate 18 - AD042_WB_018 - West elevation, showing 20th century red brickwork and wall scar.



Plate 19 - AD042_WB_019 - West elevation, showing crack to sandstone ashlars opening through to east elevation.



Plate 20 - AD042_WB_020 - West elevation, showing capstones and flue stones, with cast concrete uprights.



Plate 21 - AD042_WB_021 - West elevation, showing capstones and flue stones, with cast concrete uprights.



Plate 22 - AD042_WB_022 - West elevation, showing sandstone and concrete fill to north-west corner.



Plate 23 - AD042_WB_023 - West elevation, showing dropped capstone.



Plate 24 - AD042_WB_024 - West elevation, showing capstone and cast concrete uprights.



Plate 25 - AD042_WB_025 - West elevation, showing pinch spalling.



Plate 26 - AD042_WB_026 - Showing relationship to East chimney.



Plate 27 - AD042_WB_027 - West elevation, showing fall of the north flue from plumb.



Plate 28 - AD042_WB_028 - North elevation, showing cementitious mortar fill.



Plate 29 - AD042_WB_029 - North elevation, showing string course profile.



Plate 30 - AD042_WB_030 - North elevation, showing string course.



Plate 31 - AD042_WB_031 - North elevation, showing decayed sandstone ashlar with cementitious mortar above.



Plate 32 - AD042_WB_032 - North elevation, showing capstone, cast concrete uprights and flue stone.



Plate 33 - AD042_WB_033 - East elevation, showing evidence of mud-casting to concrete upright.



Plate 34 - AD042_WB_034 - 3/4 view of north and east elevations, showing string course.



Plate 35 - AD042_WB_035 - East elevation, showing iron hook/strap.



Plate 36 - AD042_WB_036 - 3/4 view of north and east elevations, showing pinch spalling and flashing line to former roof.



Plate 37 - AD042_WB_037 - East elevation, showing cap stones to flues 1 and 2.



Plate 38 - AD042_WB_038 - East elevation, showing cap stones to flues 3 and 4.



Plate 39 - AD042_WB_039 - East elevation, showing visible extents.



Plate 40 - AD042_WB_040 - East elevation.



Plate 41 - AD042_WB_041 - East elevation, showing 1626 roofline, patches of lime plaster, crack and later inserted flue (white brick).



Plate 42 - AD042_WB_042 - East elevation, showing inserted flue (5; white brick).



Plate 43 - AD042_WB_043 - East elevation, showing crack.



Plate 44 - AD042_WB_044 - East elevation, showing capstones to sandstone ashlar coursing.



Plate 45 - AD042_WB_045 - East elevation, showing remaining evidence of 1626 roofline.



Plate 46 - AD042_WB_046 - East elevation, showing 1626 roofline and surviving lime plasterwork.



Plate 47 - AD042_WB_047 - East elevation, showing crack and flashing line to 1783 roof.



Plate 48 - AD042_WB_048 - East elevation, showing iron hook/strap.



Plate 49 - AD042_WB_049 - East elevation, showing collapsing masonry and later lead flashing to 1783 roofline.



Plate 50 - AD042_WB_050 - East elevation, showing brickwork supporting upper masonry to south end of east elevation.



Plate 51 - AD042_WB_051 - East elevation, showing latter flue (5) addition in white brick.



Plate 52 - AD042_WB_052 - East elevation, showing surviving lime plaster.



Plate 53 - AD042_WB_053 - East elevation, showing later flue brickwork in white.



Plate 54 - AD042_WB_054 - East elevation, showing 1626 roofline.



Plate 55 - AD042_WB_055 - East elevation, showing surviving plasterwork scratch and float coat.



Plate 56 - AD042_WB_056 - South elevation, showing flue 5.



Plate 57 - AD042_WB_057 - South elevation, showing iron support to former 3rd floor fireplace.



Plate 58 - AD042_WB_058 - South elevation, showing numbering to limestone flue cap.



Plate 59 - AD042_WB_059 - South elevation, showing former first floor fireplace.



Plate 60 - AD042_WB_060 - Chimney after removal of rows 1 and 2, showing flue stones.



Plate 61 - AD042_WB_061 - Chimney after removal of rows 1 and 2, showing flue stones.



Plate 62 - AD042_WB_062 - Chimney after removal of rows 1 and 2, showing flue stones.



Plate 63 - AD042_WB_063 - Chimney after removal of rows 1 and 2, showing flue stones 1 and 2.



Plate 64 - AD042_WB_064 - Chimney after removal of rows 1 and 2, showing flue stones 3 and 4.



Plate 65 - AD042_WB_065 - Chimney after removal of rows 1 and 2, showing flue stones 4 and 5.



Plate 66 - AD042_WB_066 - Chimney after removal of row 3.



Plate 67 - AD042_WB_067 - Chimney after removal of row 3.



Plate 68 - AD042_WB_068 - Chimney after removal of row 4.



Plate 69 - AD042_WB_069 - Chimney after removal of row 4, showing flue 2.



Plate 70 - AD042_WB_070 - Chimney after removal of row 4, showing flue 2.



Plate 71 - AD042_WB_071 - Chimney after removal of row 4.



Plate 72 - AD042_WB_072 - Chimney after removal of row 4.



Plate 73 - AD042_WB_073 - View showing chimney in relation to north, east and west chimneys.



Plate 74 - AD042_WB_074 - Chimney after removal of row 5.



Plate 75 - AD042_WB_075 - Chimney after removal of row 5.



Plate 76 - AD042_WB_076 - Chimney after removal of row 6.



Plate 77 - AD042_WB_077 - Chimney after removal of row 6.



Plate 78 - AD042_WB_078 - Chimney after removal of row 6.



Plate 79 - AD042_WB_079 - Chimney after removal of row 7 and partial row 8.



Plate 80 - AD042_WB_080 - Chimney after removal of row 7, showing north cementitious mortar lined flue 1.



Plate 81 - AD042_WB_081 - Chimney after removal of row 7.



Plate 82 - AD042_WB_082 - Chimney after removal of row 7.



Plate 83 - AD042_WB_083 - Chimney after removal of row 7, showing flues 1, 2 and 3.



Plate 84 - AD042_WB_084 - View showing chimney in relation to north, east and west chimneys.



Plate 85 - AD042_WB_085 - View showing chimney in relation to north, east and west chimneys.



Plate 86 - AD042_WB_086 - Pallet 1



Plate 87 - AD042_WB_087 - Pallet 2



Plate 88 - AD042_WB_088 - Pallet 3



Plate 89 - AD042_WB_089 - Pallet 4



Plate 90 - AD042_WB_090 - Pallet 5



Plate 91 - AD042_WB_091 - Pallet 6



Plate 92 - AD042_WB_092 - Pallet 7



Plate 93 - AD042_WB_093 - Pallet 8



Plate 94 - AD042_WB_094 - Pallet 9



Plate 95 - AD042_WB_095 - Pallet 10



Plate 96 - AD042_WB_096 - Pallet 11



Plate 97 - AD042_WB_097 - Pallet 12



Plate 98 - AD042_WB_098 - Pallet 12, showing base of octagonal stack.



Plate 99 - AD042_WB_099 - Pallet 13



Plate 100 - AD042_WB_100 - Pallet 14



Plate 101 - AD042_WB_101 - Pallet 15



Plate 102 - AD042_WB_102 - Pallet 15



Plate 103 - AD042_WB_103 - Pallet 16



Plate 104 - AD042_WB_104 - Pallet 16



Plate 105 - AD042_WB_105 - Pallet 17



Plate 106 - AD042_WB_106 - Pallet 19



Plate 107 - AD042_WB_107 - Pallet 18



Plate 108 - AD042_WB_108 - Pallet 20



Plate 109 - AD042_WB_109 - Pallet 20



Plate 110 - AD042_WB_110 - Pallet 21



Plate 111 - AD042_WB_111 – General view of palletised masonry.



Plate 112 - AD042_WB_112 - Chimney after removal of row 8.



Plate 113 - AD042_WB_113 - Chimney after removal of row 8, showing flues 3 to 5.



Plate 114 - AD042_WB_114 - Chimney after removal of row 8, showing flues 1 and 2.



Plate 115 - AD042_WB_115 - Chimney after removal of row 8, showing flue 2 and area of lost brickwork.



Plate 116 - AD042_WB_116 - Chimney after removal of row 8.



Plate 117 - AD042_WB_117 - Chimney after removal of row 8.



Plate 118 - AD042_WB_118 - Chimney after removal of row 8.



Plate 119 - AD042_WB_119 - Chimney after removal of row 8.



Plate 120 - AD042_WB_120 - South window exterior, showing surviving brass casement to sandstone window.



Plate 121 - AD042_WB_121 - South window exterior, showing rolled steel joists (RSJ).



Plate 122 - AD042_WB_122 - South window exterior, showing window heads and hood mould.



Plate 123 - AD042_WB_123 - South window exterior, showing sills and fallen masonry.



Plate 124 - AD042_WB_124 - South window exterior.



Plate 125 - AD042_WB_125 - South window interior.



Plate 126 - AD042_WB_126 - South window interior, showing RSJs.



Plate 127 - AD042_WB_127 - South window interior, showing RSJ pad.



Plate 128 - AD042_WB_128 - South window interior, showing RSJ pad.



Plate 129 - AD042_WB_129 - South window interior, showing hanging masonry.



Plate 130 - AD042_WB_130 - South window interior, showing deteriorating sandstone window head, east.



Plate 131 - AD042_WB_131 - South window interior, showing showing deteriorated sandstone window head, west.



Plate 132 - AD042_WB_132 - South window interior, showing RJS temporary siting.



Plate 133 - AD042_WB_133 - South window interior, showing RSJ temporary siting.



Plate 134 - AD042_WB_134 - South window interior, showing surviving timber lintel.



Plate 135 - AD042_WB_135 - South window interior, showing wall masonry section, east.



Plate 136 - AD042_WB_136 - South window interior, showing temporary RSJ siting and masonry to be removed.



Plate 137 - AD042_WB_137 - South window, showing wall masonry cross section, west.



Plate 138 - AD042_WB_138 - South window, showing temporary RSJ siting and masonry to be removed.



Plate 139 - AD042_WB_139 - South window, showing temporary RSJ siting and masonry to be removed.



Plate 140 - AD042_WB_140 - South window, showing temporary RSJ siting and masonry to be removed.



Plate 141 - AD042_WB_141 - South window, showing temporary RSJ siting and masonry to be removed.



Plate 142 - AD042_WB_142 - South window interior, showing hanging masonry.



Plate 1423 - AD042_WB_143 - South window, showing GRD1 - interior.



Plate 144 - AD042_WB_144 - South window, showing GRD2 - middle.



Plate 145 - AD042_WB_145 - South window, showing GRD3, exterior.



Plate 146 - AD042_WB_146 - South window, showing lead fixing joint, west.



Plate 147 - AD042_WB_147 - South window, showing lead fixing joint, west.



Plate 148 - AD042_WB_148 - South window, showing glazing bar socket, east.



Plate 149 - AD042_WB_149 - South window, showing glazing bar socket, west.



Plate 150 - AD042_WB_150 - South window, showing hollow mould of mullion, east.



Plate 151 - AD042_WB_151 - South window, showing showing hollow mould of mullion, west.



Plate 152 - AD042_WB_152 - South window, showing window head with glazing lead, west.



Plate 153 - AD042_WB_153 - South window, showing hood moulding.



Plate 154 - AD042_WB_154 - South window, showing window head with glazing lead, east.



Plate 155 - AD042_WB_155 - South window, showing start of supporting brickwork.



Plate 156 - AD042_WB_156 - South window, showing supporting brickwork complete to exterior.



Plate 157 - AD042_WB_157 - South window, showing supporting brickwork exterior skin, inner face.

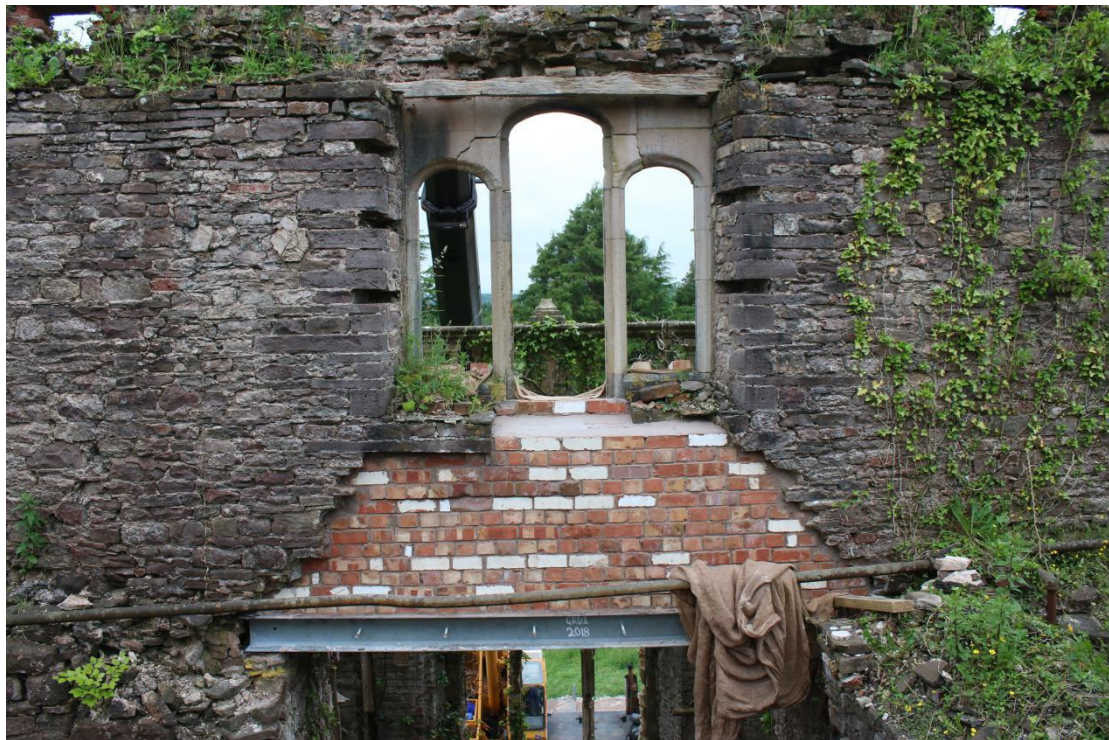


Plate 158 - AD042_WB_158 - South window, showing supporting brickwork complete to interior.



Plate 159 - AD042_WB_159 - South window, showing supporting brickwork complete to exterior.

APPENDIX III

Historical Background