

Norwich Castle, a Royal Palace Reborn: Inception, Design and Investigation

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Norwich Castle is Grade I listed and sited on a scheduled ancient monument within the Civic Character Area of the wider Norwich City Centre Conservation Area. In 2017, Feilden+Mawson was awarded the contract for RIBA Stages 3–6 design and development of the Norwich Castle: Royal Palace Reborn Project. Background research, academic studies, user assessments and peer evaluations shaped the project and defined the designs, vision and final proposals. These were submitted in July 2018 and approved in November 2018, to secure the world class heritage offer and long-term beneficial use of Norwich Castle as a museum and visitor centre, including the British Museum Partnership Gallery of the Medieval Period at first floor level.

In early 2019 it was expected to start on site by that autumn but since then, we have endured the sudden and unexpected passing of Hugh Feilden, Brexit, the re-structuring of the local planning authority, a world health pandemic and material shortages across the construction industry. While all of these have had an impact on the project, none of these exceptional circumstances has tested the design and the aspirations of the project more than the castle itself which only began to reveal its secrets once work started on site. Because of this extended timetable for the project, it is intended to consider its implementation in a subsequent article in Transactions.



Fig 1 Norwich Castle keep with the existing William Wilkins building to the right

HISTORICAL BACKGROUND

Constructed between 1066 and 1075 for William the Conqueror, the castle originally took the form of a motte and bailey. Historians have determined that the stone keep which stands

today was most likely constructed between 1095 and 1110. Drawing comparison with Falaise in Normandy and Castle Rising in west Norfolk, Norwich's keep was designed for William II as a royal palace and fortified site. Following his



Fig 2 Birdseye view showing the extent of the project site, north to the left

death it was completed by his brother Henry I, possibly by his visit to Norwich in 1121. By the early 1300s the building was being used as the county gaol. Later phases of work were carried out by the notable architects Sir John Soane, William Wilkins and Robert Atkinson.

In the late 1880s it was transformed by the Norwich architect Edward Boardman for museum use. The later 1960s and 1970s infills and renovations were carried out by the Norwich City Architect of the time, David Percival. The last phase of significant intervention was designed by Allies and Morrison Architects and carried out by Purcell Miller Tritton in 1999–2000, when a new external lift and café were introduced along with a significant repair programme throughout the galleries and keep.

Of major significance to the proposals is the fabric of the keep itself – specifically the original Norman walls which are exposed internally and expressed externally in stonework from the over-cladding which was carried out in the 1830s by Francis Stone and Anthony Salvin. Internally, much of what is present beyond the structure of the keep can be dated back to Boardman and elements of this will be adapted or recorded, archived and removed from site.

FUTURE VISION AND DESIGN INTENT

At the heart of the vision and client brief was the necessity to increase visitor numbers and to provide step free access from the ground floor of the keep all the way to a new roof terrace. The project scope also includes the areas to the east of the keep, the existing Wilkins entrance and a number of Boardman's rooms, plus some of the 1960s Percival Building, including the later café alteration which is located directly north of the keep (Fig 2).

It is within these areas that the designs and interventions will:

- provide a world class visitor experience in the heart of Norwich which allows the visitors to understand one of the most important surviving 12th century buildings through the architectural interventions and new interpretation
- rebuild the principal floor across the full floorplan of the keep, building new internal walls in the most historically accurate positions to recreate the original volumes of the Great Hall and ancillary spaces, Chapel and King's Chamber
- significantly increase visitor capacity from 330 to 855 people at any one time, as well as providing inclusive access for all to all levels
- improve visitor facilities, including ease



Fig 3 Proposed new entrance seen from the bridge



Fig 4 Proposed bridge from keep to Percival Building

of access, reception and welcome area, gift shop and café and facilities, including changing places

- provide a design to allow for a multitude of different visitor experiences and a range of activities
- provide a separate school entrance to assist with visitor flow
- create a space which maintains connections to the local community
- maintain the building in long term beneficial use, including upgrades to fabric to integrate contemporary lighting, interactive audio-visual technologies as well as present day considerations for well-being and safety.

While there are many aspects to this complex and ambitious scheme, there is a handful of interventions which delivers the vision in an architectural language which is wholly contemporary and instantly recognisable as a modern alteration.

The first of these, visible on approaching the museum, will be the repositioning of the main entrance into the complex, situated directly opposite the bridge (Fig 3). A new glass and timber-finned bridge will span between the keep and the Percival Building. This is key to the delivery of the brief, allowing increased visitor numbers and means of escape and also giving the visitor the opportunity to view the keep from a new vantage point. The bridge also takes its cues from history and allows a fully accessible primary route onto the principal floor of the keep for any visitor. Interpretation at the entry point will allow equal intellectual access for those choosing that route into the keep (Fig 4).

A new glass atrium, including the re-working of the entrance and reception, café, and gift shop, will remove the confined tunnel which previously connected the rotunda, cafe and guest facility areas to the entrance. Through the creation of the atrium we are able to drastically change the relationship between visitor and the keep by creating a space which reveals and showcases the east wall of this spectacular building (Figs 5, 6).

The second key intervention is a new lift within the keep itself, providing fully inclusive access to all levels of the keep, including the new roof terrace (Fig 7). This was intended to be provided by a new glazed lift, which would also act as a 60-minute fire rated evacuation

lift and protected shaft and was part of the consented planning and listed building application.

The third intervention is the introduction of a number of doors through the keep wall as well as the widening of some existing doors. A new northwest door tunnels through approximately 3m of flint rubble wall at ground floor level and will connect the facilities to the north of the keep and also act as an inclusive route and means of escape. We are also forming a new opening in the east wall, at principal floor level, which will lead to the bridge and Percival Building facilities. A number of other key routes will also be widened. While the lift, bridge and atrium will be expressed primarily in materials which are distinctively different to the Norman fabric of the keep, these works will be detailed using traditional building materials such as stonework and lime mortars and renders.

As Norwich Castle is a Grade I listed building and its mound is a scheduled ancient monument, two different consents are required for the proposals, one dealing solely with the above ground proposals from the local planning authority (LPA), while the below ground works require scheduled monument consent, granted by the Secretary of State for Digital, Culture, Media and Sport based on advice provided by Historic England (HE). Where the two meet, the design must balance the disturbance of any below ground archaeology against the beneficial alterations of the above ground proposals and overall public benefit of the scheme. It is at this junction, between above and below ground and the discussions between archaeological discoveries and their impact on the consented architectural vision, that we find ourselves today.

NEW LIFT DESIGN

In November 2019 the first round of scheduled monument consent (SMC) applications were being evaluated by HE. These permissions were needed to begin groundwork investigations ahead of the final submissions for the below ground works. Due to the depth of the lift pit required, its proximity to the 2m wide spine wall and more importantly the area of undisturbed archaeological deposits below it, it quickly became apparent that HE would not grant permission for such exploratory work or



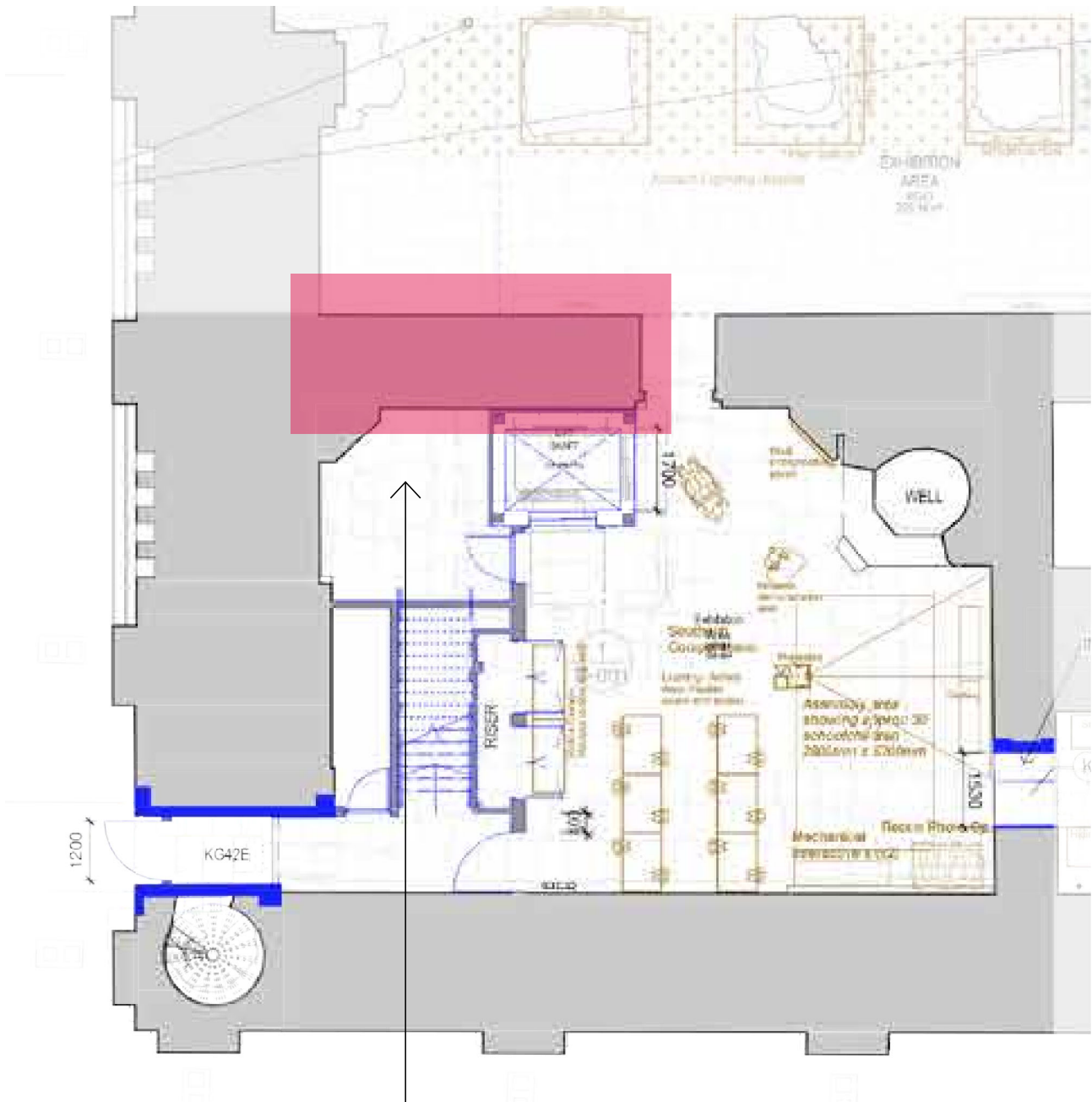
Fig 5 Proposed new castle entrance



Fig 6 Proposed new atrium



Fig 7 Accessible roof terrace with retained crenellation



Archaeology that would be removed if wall is underpinned

Fig 8 Plan showing the extent of removal below the spine wall required for underpinning



Fig 9 Archaeological investigation in front of the Norman spine wall. The 12th-century jamb is also visible.

indeed for the necessary intervention required by the structural engineers Conisbee in terms of underpinning and strengthening. In order to avoid disturbing any of this area the lift needed to move to the south by a minimum of 800mm to an area which had historically already been fully disturbed (Figs 8, 9).

Investigations carried out by Feilden+Mawson demonstrated to the statutory authorities that it was not feasible to move the consented lift to the south without impacting dramatically on the existing building at upper levels. In order to preserve the below ground archaeology, and to maintain a glass lift within

the same position, significant members of the Boardman roof truss would need to be removed. The study also showed that there would be an impact on the scheme's ability to comply with *The Building Regulations 2010 Approved Document Part B – Fire Safety and Part M – Access to and use of buildings*.

The design team worked intensively on testing the position of the lift within the keep against the many significant constraints and determined that a redesign of the lift shaft itself would be the best outcome, ensuring that a fully compliant DDA lift with a 60-minute fire-rated shaft could be fitted within the zone already identified within the consented scheme. The biggest impact from this reassessment was that the lift could no longer be fabricated of glass. However, by removing this specific requirement we would be able to place the car much further away from the spine wall, reducing the amount of structural intervention and overall impact on archaeology.

Using conventional methods for the lift's construction would also allow us to provide more of a gap and separation between the new lift and the medieval spine wall doorway's southwest jamb. According to the archaeological assessment of the Norman keep carried out by Dr Roland Harris, the central spine wall's ground floor opening has 'jambs that themselves are not Romanesque work, having claw-chisel tooling and stop chamfers, and probably date to the 13th century. The adjacent stonework, however, is evidently primary, since it does not course with the ashlar of the jambs and has distinctive horizontal tooling of the primary basement ashlar'. Repositioning the lift would also be of benefit to the heritage asset and the overall visitor experience in understanding the building as there would no longer be a requirement to enclose part of the spine wall (Figs 10, 11).

The changes were significant as:

- The revised positioning sits within the same footprint as the extant permission. While the appearance of the lift will be different, the principles established and accepted within the consented scheme remain the same.
- The repositioning of the lift pit, away from the spine wall, protects an area of undisturbed archaeology to the spine wall area. The revised position for the lift pit is

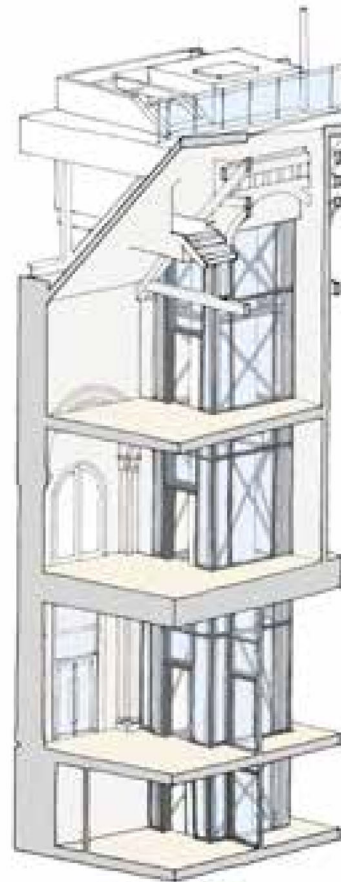


Fig 10 Lift as approved by the LPA and HE in the extant permission

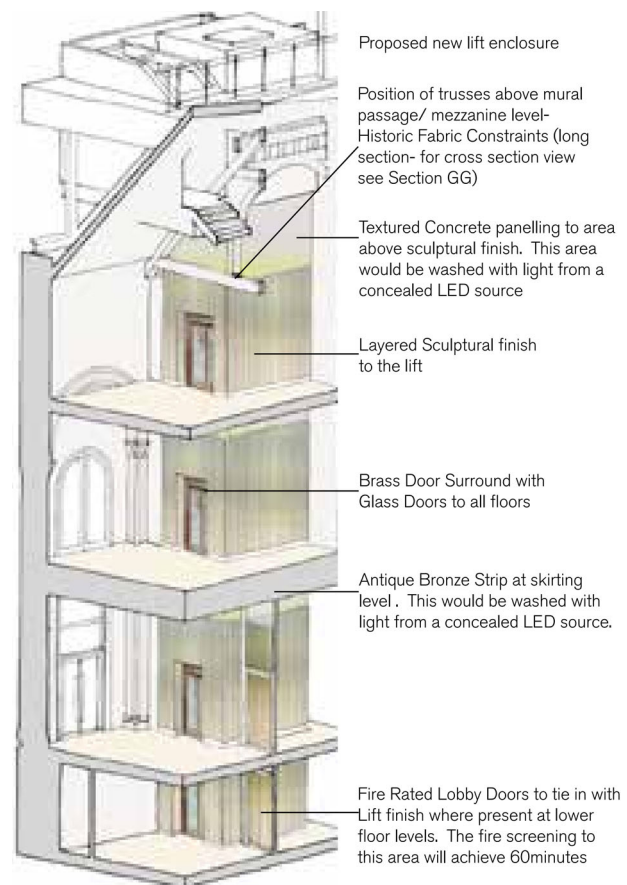


Fig 11 The proposed new lift as resubmitted and approved by the LPA and HE

above an area which has been previously excavated and directly into the mound.

- By moving the lift away from the spine wall 800mm we are able to step the required 60-minute fire line away from the Norman door jamb.
- The repositioning of the door from the south side of the lift into the west, and the reworking of the stair, removes the need to escape (in the event of fire) through the exhibition space towards the south-west door. This also removed the necessity to have a fire curtain, and its associated framing, fixed into the south wall of the keep.

Due to the change in aesthetics and the benefits demonstrated by the assessments, after many months of discussions with the LPA and HE, in November 2020 the scheme was re-submitted to the local authority as applications under Section 73 Non-material amendment (Town and Country Planning Act 1990) and Section 19 of the Planning (Listed Building and Conservation Areas) Act. The revised position of the lift was granted consent in April 2021, but as part of the approval there remains a condition regarding the fabrication and detailing of the final finish which will be applied to the shaft wall construction.

INVESTIGATION

At the same time as the resubmission, Morgan Sindall Construction was awarded the building contract for the project. Its instruction came at a time of uncertainty for the client and the construction industry due to the worldwide health pandemic, resulting in a change to the working methodologies across England and the construction industry as a whole.

Importantly for the project's success and programme, it was necessary to enter into a contract due to the intertwined design responsibility between the consultants and the contractor. Their involvement was also required as many of the planning and listed building conditions could not, and would not, be discharged without being able to demonstrate with certainty the specialist sub-contractors who would be responsible for the installation and final working detail. Given the importance of how the proposals would sit adjacent to or fix into the historic fabric the consultant team and stakeholders were eager to begin discussions with the many experts,

specialists and craftsmen. With the revised planning and listed building application in for determination, this time was initially used to deal with some pre-start conditions, notably the Construction Method Statement, a Demolition Method Strategy and a Disposal Strategy, which were fully reliant on the contractor to clear.

The time was also used fruitfully to review access to the works and how to deliver the scheme, with some amendments being proposed to the sequencing which would, in theory, better safeguard the building. For example, resequencing works removed the requirement for a tent scaffold over the keep. Methodologies were proposed by the contractor to alter the way in which the steelwork was inserted within the keep, including the new roof platform removing the need to open up the roof fully, offering a benefit to the programme and reducing the risk of having the building open to the elements for an extended period.

Morgan Sindall was also tasked with reviewing the programme to push back works to the keep until the new permissions were granted and to bring forward works which did not need any further LPA or SMC approvals. This turned the immediate focus to the below ground drainage within the keep, the opening of the ground floor northwest door as well as the southwest door, all of which could be done in parallel with the new toilets, changing places and the Rotunda café block, a self-supporting two-storey steel and timber structure on concrete piles which is being inserted into the space previously occupied by the café.

With the relevant project pre-commencement conditions and SMC approvals already in place to cover the trial holes and scope for the final size and positioning of the piling for the toilet block, the site team and archaeologist Heather Wallis with Oxford Archaeology, led by Dr Tim Pestell, Senior Curator of Archaeology for Norfolk Museums Service, were able to make meaningful progress with the existing café's below ground archaeological investigations.

The new toilet block immediately to the north of the keep has been deemed as one of the areas of exceptionally high archaeological research potential. The 13th century Great Hall built in the reign of Edward I is suspected

to have been located here and c1579 a new Shirehouse had also been built here. Records show that pockets and trenches in this old café area had been previously investigated under a watching brief in 1999 which are documented in the HPS Archaeology Archives by H Wallis.

Even where designers have used historical records to try minimising impact over known archaeological remains, the previous map of excavations undertaken needed to be reviewed and cross referenced with the Palace Reborn (Gateway) proposals. This exercise highlighted that the location of the proposed ten piles had not all been excavated. Therefore, excavation and recording was deemed absolutely necessary to all below ground layers which would be impacted by the reinforced concrete piles. This also provided an archaeological challenge as the entire mound on which the keep stands is archaeological, being ground made up by the Normans. The composition of the mound is not fully understood, so care is needed when adding loads to its surface. The approach agreed by HE was to excavate 1x1m boxes around the location of each 450mm pile to a depth that removed all occupation horizons down to the mound make-up. A sample of the piles were window-samples to understand the depth and make-up of the Norman mound. These archaeological investigations took place during the last quarter of 2020 and early 2021.

The assessment of the archaeology around each of the ten piles required for the toilet block revealed remains requiring the relocation of six piles. Each pair of piles had been originally proposed to be connected through new ground beams running north to south in five bays of across the block. The six piles that had to move to avoid archaeology had to be moved in pairs, meaning if only one pile in a pair was hitting archaeology the other also had to move. This meant that the structural engineers, Conisbee, had to re-assess and re-run calculations for the toilet block and that new connecting ground beams running east to west had to be added to the design proposals.

Redesign while in the middle of site works is a regular occurrence in projects with highly sensitive archaeology and historic architectural fabric; reacting to such historical findings triggering re-adjustments to the design has been a difficult but essential feature of the project,

not only because the main goal is to safeguard history but because presenting this historic fabric is a fundamental aim of the project.

THE NORTHWEST DOOR

As the design team and client found themselves in the unavoidable position of needing to submit a revised planning and listed building consent application, Dr Tim Pestell, lead custodian of the castle keep, took this opportunity to revisit the position of the northwest door in order to preserve an original Norman stone cill and the associated ashlar jambs to a window (Fig 12). Very early on in the project, this opening was identified as a key access and egress route for materials and machinery and by this point in time the steelwork had already been procured and fabricated.

The design team was then challenged to find a way to amend the proposals, originally intended to be a perpendicular tunnel, to suit an opening which would now be inserted at an oblique angle. Eventually it was agreed to stagger the portal frames slightly and to allow new triangular plates to be bolted on the steelwork at the edges of the opening. Conisbee, Feilden+Mawson and the stone masons were required to work closely to ensure that the changes did not have an impact on what would be the final lime and stonework finish. Given the



Fig 12 Norman cill and jambs to be preserved



Fig 13 Opening through the north wall from outside



Fig 14 The new opening breaking into the keep



Fig 15 Inside the keep, new opening bottom centre

depth of this opening, probably best described as a short tunnel, the proposal was to form it by inserting a series of permanent steel portal frames which would allow smaller sections of medieval wall to be carefully removed for the full height and width but with reassurance that the surrounding fabric would remain stable (Fig 13).

The make-up of the wall, which was assumed to be rubble cored, was essentially unknown and therefore the entire process was subject to a watching brief to record and document any

discoveries. In this instance varying the design vision and architectural intent for any found archaeology would be impossible. The key to the doorway's formation relied on the accurate forward motion of the stonemasons, who had a very difficult time removing well-bonded flintwork without damaging adjacent areas. The site team also remained under pressure, as key to the success of the repositioning was the assurance that the adjacent Norman cill and jambs would be preserved – a task which was made more complicated by the main contractor wishing to tunnel into the keep rather than outwards from inside the keep where this Norman fabric is actually visible.

It took roughly a month to tunnel through 3m of Norman flint rubble wall but we have now broken into the keep. However, the full formation will not be completed until the structural engineers are able to inspect and advise on any extra temporary measures required before the final two intermediate steel frames and final plate can be installed. Understandably, it has also been identified that the remaining section of wall should remain as an arched opening until this final step can be agreed upon (Figs 14, 15). To date we have recovered some finely tooled Caen stone pieces framing putlog holes as well as revealing a portion of mound. The stonework has been removed and set aside to be documented by Dr Roland Harris.



Fig 16 Anomalous arch in the external arcading of the east wall of the keep

NEXT STEPS

Early investigations have begun on the opening through the wall at principal floor level which will lead from the keep to the new bridge. Hugh Feilden had always hoped to find evidence of an opening within this area which would help to explain the anomalously large arch in the arcading to the exterior of the east face. Early indications have yet to provide such evidence (Fig 16).

The positioning of the beam bearing ends for the new steelwork has begun, with an initial focus on the principal floor. The new and reinstated floors rely on the formation of pockets within the keep walls into which the steel beam-ends will be housed. Investigations are ongoing on site to review each and every bearing to position these within existing areas of historic alteration and/or damage. This too has elicited some very interesting debates among the design team and the stakeholders. As we continue to take cues from the existing building, small design changes are required in order to do the best for the building, which can sometimes be at odds with the consented drawings (Figs 17, 18, 19).

The most dramatic change to the space has been the very recent removal of the Boardman floor. For the first time in 140 years the full volume of the keep is visible and what is so clearly understood is the relationship of

the principal floor to the spaces above and below it (Figs 20, 21, 22). Our proposals will leave sections of these spaces open and will ensure that future generations are able to appreciate and understand just how spectacular



Fig 17 Formation of new pocket within wall of keep to take the new steel floor



Fig 18 Flintwork wall to the Bigod Tower

this building is and how grand and impressive it would have been in the 12th century.

Overall, the proposed scheme is almost indefinably complex, not only in terms of the proposed designs, but how these relate to the existing building and how to best manage change. This is for the most part motivated by the drive to retain layers of history and to ensure that, where appropriate, any new discovery is appraised and evaluated before a decision is taken whether to alter the design or to proceed as intended. It seems almost impossible to think that this building can hold any more discoveries for Dr Tim Pestell, who upon our initial meeting, swiftly scuttled around the castle to highlight graffiti and tool markings in the most obscure of places – thoroughly demonstrating an unrivalled knowledge of all the cracks and crevices of this beautiful building. Yet this still seems to be the case.

The architectural interventions have enabled us the opportunity to strip back the building even further in order to, with good reason, realign steelwork, or to shift our interventions ever so slightly. The job of recording and documenting the objects and fabric which have been found has taken



Fig 19 Southwest corner of the keep, with staircase salvaged from the site



Fig 20 View looking east toward Norman door leading into the Bigod Tower



Fig 21 View looking southeast toward the King's Chapel in the distance



Fig 22 View of east wall highlighting the original volume of the spaces

the best part of a year. In some instances we have had to accept that photographs and documentation is all that will be left, whereas in other areas we have tried to incorporate the discoveries and layers of history into a redesign. This process, albeit time consuming and with many known risks, not to mention implications on both programme and costs, is putting the quality of the finished visitor experience at the forefront of everything the team is presently working on.

ACKNOWLEDGEMENTS

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Fig 2, with acknowledgements to Skeye Surveyors All other images by courtesy of Feilden+Mawson

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PROJECT TEAM FOR INCEPTION AND DESIGN

Client – Norfolk Museums Service

Architect and Conservation – Feilden+Mawson LLP

Structural Engineers – Conisbee

Services Engineers – Sweco

Fire Engineers – MLM Group

Project and Cost Management – Artelia

Exhibition Designers – Haley Sharpe Design

Archaeology – Oxford Archaeology East/Heather Wallis

Measured Surveys – Dr Roland Harris &

Downland Partnership

Activity Planners – Tricolor

Business Planners – Bryn Jones Associates

Marketing and Communications Plan – Bryn Jones Associates

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