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Devizes Castle – Fernery

The structural inadequacies and defects that have been surveyed and the associated remediation measures outlined in this report have been carefully considered by the Architects Scott & Twine and BLDA and are incorporated into the proposals for the sensitive conservation repairs, restorations and refurbishments proposed for the externals and internals of the Fernery and its fabric.

Introduction

The external elevation of the fernery was inspected on 25th May 2022, and it consists of a colonnade of 14 columns (2No. outer engaged square and 12No. circular) which support interlaced arches, which, in-turn, support the roof structure. The columns are supported on a stonework plinth which has a cill. The eastern elevation is constructed with two colonnades (an inner and an outer) each with the interlaced arches. The two colonnades are separated by the glazing and would appear to be connected at the capital which is constructed as one piece for both columns. An external view of the eastern elevation of the fernery is shown on photographs No. 1 and No. 2.


Photograph No. 1


Photograph No. 2

Photograph No. 3 shows a general view of the roof of the fernery and there are slipped, and missing tiles as can be seen on photograph No. 4.



Photograph No. 3

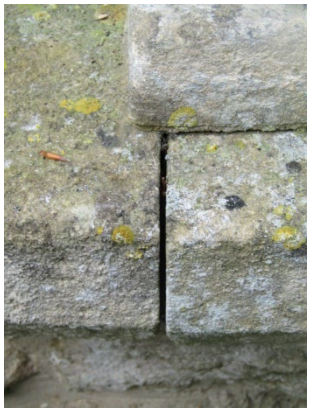


Photograph No. 4

External

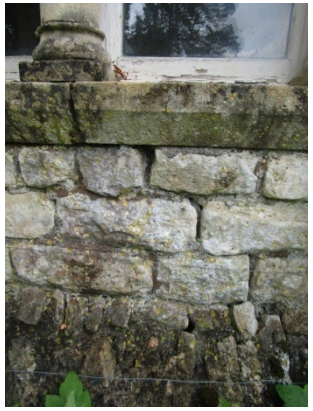
The table below sets out the condition of the external elevation of the fernery and the features are referenced from north to south. The numbering in the table indicates the positions of the columns and there is a doorway between columns 5 and 6. If there is no photograph or comment then this indicates it is in a structurally satisfactory condition.

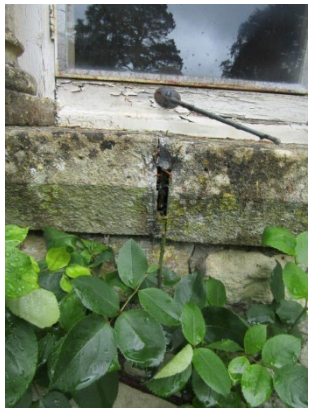
Column No. (North to South)	Wall Head	Interlaced Arches	Column	Cill	Plinth
1	 Open joints  Open Joints	 Displacement and loss of pointing	 Damage to stonework		 Vegetation and open joints on lower section of plinth

Column No.	Wall Head	Interlaced Arches	Column	Cill	Plinth
2	 Open joint	 Displacement	 Slight cracking at top	 Open joint	 Open joints on lower section of plinth between columns 2 & 5
3		 Slight opening of joint			
4		 Slight opening of joint			

Column No.	Wall Head	Interlaced Arches	Column	Cill	Plinth
5		 Cracking and displacement			
6	 Open joint	 Cracking and displacement	 Capital has no bearing on column and the column can be moved by hand  Fracture through column	 Historic displacement	

Column No.	Wall Head	Interlaced Arches	Column	Cill	Plinth
7	 Open joints	 Very slight cracking through joint	 Slight cracking at top, column can be moved by hand		
8		 Very slight cracking through joint and loss of mortar	 Slight displacement (historic)		

Column No.	Wall Head	Interlaced Arches	Column	Cill	Plinth
9		 Large displacement in both north-south and east-west directions	 Friable stone on north face	 Slight displacement and open joint	 Vegetation and open joints on lower section of the plinth
10	 Open joints	 Very slight opening of the joint		 Open joint	 Open joints

Column No.	Wall Head	Interlaced Arches	Column	Cill	Plinth
11	 Open joints			 Open joint	 Slight opening of the top of the lower stonework

Column No.	Wall Head	Interlaced Arches	Column	Cill	Plinth
12	 Open joints	 Small displacement	 Friable stone on base of capital  Friable stone on north face	 Open joint	 Open joints  Voided area in lower section of plinth

Column No.	Wall Head	Interlaced Arches	Column	Cill	Plinth
13		 Small displacement		 Slight displacement and open joint	 Open joints
14		 Small displacement			

Internal

A general view of the fernery is shown on photograph No. 5 and the roof structure consists of a series of rafters, each with a collar and ashlar post bearing onto the wall plate. The roof is boarded on the underside and there is evidence of water ingress on the underside of the boarding as can be seen on photograph No. 6.



Photograph No. 5



Photograph No. 6

Photograph No. 7 shows that there is cracking to the top of the northern doorway and there is further cracking in the north-eastern corner as can be seen on photograph No. 8.



Photograph No. 7



Photograph No. 8

There is displacement at the junctions between the stones of the interlaced arches and fractures through the two brickwork courses above as can be seen on photographs No. 9 and No. 10.



Photograph No. 9



Photograph No. 10

The junction between the base of the interlaced arches and the top of the capital has acted as a hinge as there is little or no fixing between the two sections of masonry. This can be seen in photographs No. 11 and No. 12 and some of the columns can be moved by hand.



Photograph No. 11



Photograph No. 12

There is damp ingress on the base of the wall in the northern corner as indicated on photograph No. 13 overleaf and the floor has dropped at this location. Photograph No. 14 overleaf shows a grill which has been lifted exposing the channel which contained services and, at this position, the thin brickwork wall to which the grill is supported has dropped and rotated outwards.


Photograph No. 13


Photograph No. 14

Photographs No. 15 and No. 16 indicate that there are localised cracks across the floor and through the Minton style tiles.


Photograph No. 15


Photograph No. 16

Discussion and Recommendations

There is structural concern to the condition of the eastern wall of the fernery. It is constructed with interlaced arches off circular columns but there is a lack of fixity between each element. This can be identified by the displacement at the junction of the arches and also that there are columns which can be moved by hand. The roof, by its natural form, will exert a thrust on the wall head and this lack of connectivity between each element has caused the displacement. The joints on the external face of the head of the wall have also opened and the colonnade section has acted as a hinge, hence the displacement and cracking on the tracery and columns. As the fernery is buttressed by the north tower on the eastern side, the thrust has been accentuated on the western side. The roof covering has missing and slipped tiles and there is water damage to the boarding, it is therefore recommended that the roof covering is removed to allow repair to the water damaged areas. This will also allow the eastern façade to be repaired with the roof load removed.

It is recommended that the roof structure is propped, and the wall head, interlaced arches, colonnade and glazed screen are carefully dismantled and set aside for reuse apart from the decayed glazed screen which will be replaced with a Fineo Heritage unit. The wall head stones will be dowelled to each other to provide a continuous ring at the top and then these will be supported by the interlaced arches. The individual elements of the arches will be dowelled to each other and also to the wall head. The columns will be repaired, and the interlaced arches will be doweled to the capitals. By fixing each element the eastern colonnade structure will become a homogeneous element which will provide the stability. Once all the stonework has been reassembled then the roof can be recovered and it will be ensured that the roof will be tied to the wall head again to act as part of the restraint system.

The evidence suggests that the plinth has dropped in places and internally, there has been slight rotation of the brickwork wall which supports the grill over the service channel. As there are only localised areas of the plinth which are voided, it is not currently felt that underpinning the outer wall is necessary. However, an allowance should be made to grout the voided areas and locally repair the stonework to the plinth and brickwork to the service channel.

Conclusion

The fernery has extensive displacement (both external and internal) of the colonnade and especially the interlaced arches. This has been caused by an outward thrust of the roof structure and a lack of fixity between the individual elements of the colonnade. The plinth is voided in areas and there are areas where the floor has sunk and this will require localised repair.

It is recommended that the roof structure is propped and the roof covering removed and replaced on a like for like basis. The wall head, interlaced arches and columns require carefully dismantling and resetting with all elements repaired and then dowelled to each other. The roof structure will be connected to the wall head so that the complete structure acts as a homogeneous element to prevent any further movement. The glazed screen, which is a poor condition, will be replaced with Fineo Heritage units.

The structural inadequacies and defects that have been surveyed and the associated remediation measures outlined in this report have been carefully considered by the Architects Scott & Twine and BLDA and are incorporated into the proposals for the sensitive conservation repairs, restorations and refurbishments proposed for the externals and internals of the Fernery and its fabric.

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Date: 23rd August 2023