SOUTHGATE
ASSOCIATES
HERITAGE CONSERVATION SPECIALISTS

REPORT

On

BALLYCUMBER FOLLY,

BALLYCUMBER,

CO. OFFALY

For

Connie Hanniffy

Ballycumber House

Ballycumber

Co. Offaly

Prepared by: Christopher Southgate, FIEI

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1.0 Scope

We were instructed by Amanda Pedlow, Heritage Officer, Offaly County Council on behalf of the client, Connie Hanniffy to advise on strategy for the repair and consolidation of this structure together with recommendations for reroofing the folly. A methodology and specification together with sketch drawings is provided. Indicative costs based on a visual inspection are also included at the end of the report.

The inspection was visual only and in the absence of physical works to the ivy or closer access we were unable to exactly predict the condition of the stonework. However, the current proposal offers the most likely course of action based on visual inspection.

Inspection of the masonry showed that the majority of the structure is in reasonable condition, but deterioration to the top of the walls and the buttresses has occurred. It is at the top of the masonry, or at horizontal ledges where most of the masonry work will be required.

2.0 Background

It is outside the scope of this report to give a historical background since the folly is described in 'Flights of Fancy Follies, Families and Demesnes in Offaly', by Rachel Mc Kenna.

However, the likely form of the roof structure is not covered in the book.

The following research has led to the suggestion of placing a 45 ^{0} cone on the structure.

The possibilities considered were as follows:

- Gothic done
- Parabolic dome
- Catenary dome
- $y = x^3$ (Brunelleschi's) dome
- Cone

The various forms are in the Italian tradition of a gothic folly, since the owners were known to have travelled in Italy, taking note of similar structures.

Firstly, the height of the dome was considered, and a proportional study showed that a height of the dome of ½ the diameter of the eaves was likely since the proportion of the height of masonry to the overall height is approximately equivalent to the Golden ratio (the limiting sum of the Fibonacci series 1,1,2,3,5,8, etc obtained by adding the last 2 digits of the series)

18th century thinking was obsessed with such geometry and proportion and this powerful discovery suggests also that the design was by an accomplished architect and may be earlier than the 19th century date suggested.

Secondly, evidence was found on site that the rood was slated and while preparing specifications we soon came to the discovery that slating at this small radius with curvature in 2 directions would have left up to 20mm or more gap between slates.

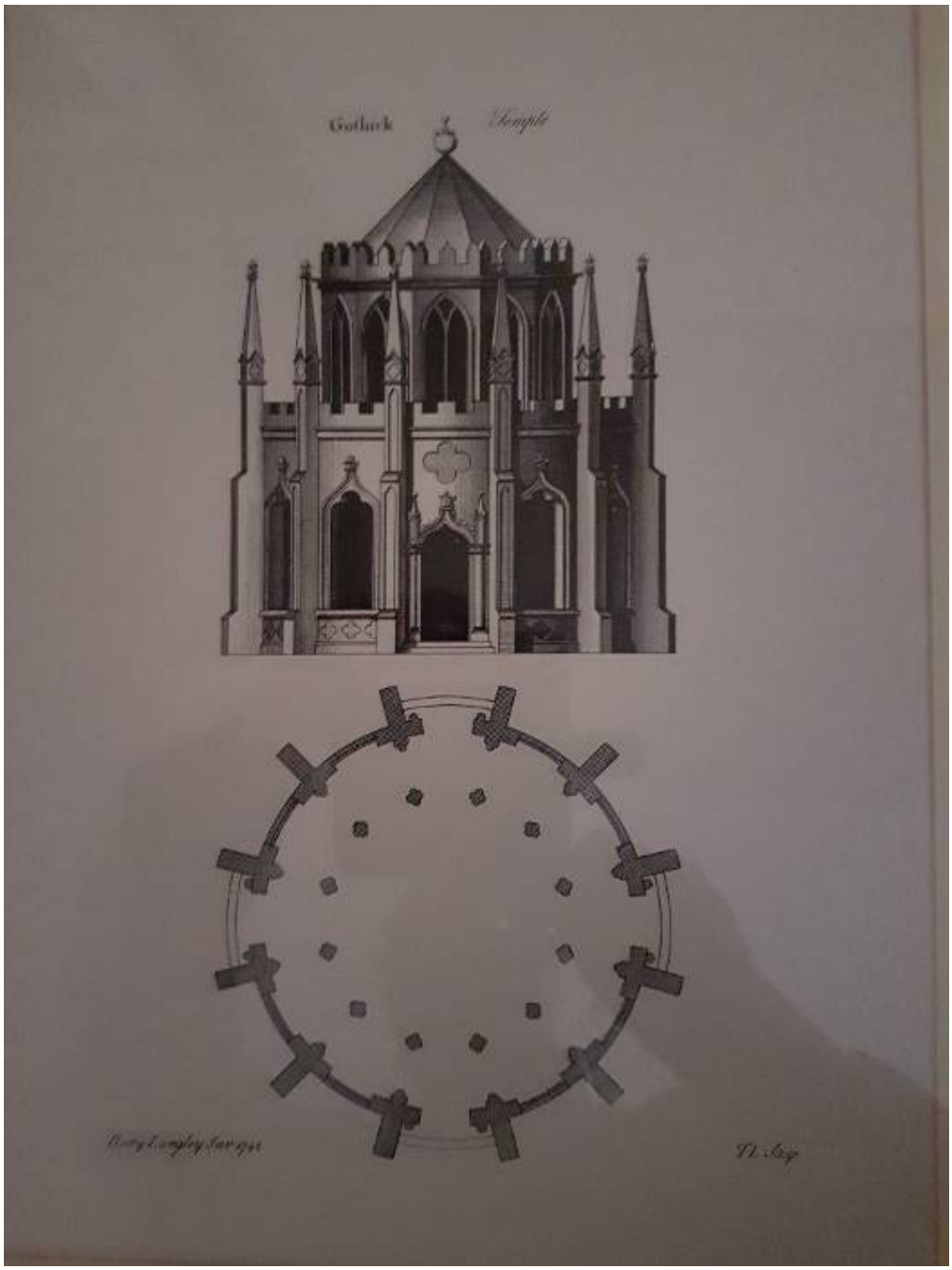
Lastly the building would appear to be in the form of a '*gothic temple'* a concept published by Batty Langley in 1742 *(Batty Langley was an English garden designer, and prolific writer who produced a number of engraved designs for "Gothick" structures, summerhouses and garden seats in the years before the mid-18th century. An important Irish example of his 18th century influence is found at the Batty Langley Lodge on the Castletown Estate in Leixlip, which was built as part of the designed landscape, to be viewed from a river walk below, by Lady Louisa Connolly prior to 1772 and given a new Gothic façade in 1785. It was adapted from Batty Langley's book on Gothic architecture. The purpose of this Gothic structure was that of a cottage orne in the opinion of Thomas Morel writing in History Ireland 'a small garden retreat where landlords and their families could enjoy the pleasures of the countryside', but it was specifically designed to be viewed from the river walk below (History Ireland, Gems of Architecture, Issue 5, Vol. 22).*

Batty Langley Lodge, Castletown Estate, Leixlip

Bellevue Gothic Cottage, Lawrencetown, Co. Galway – built possibly circa 1782 with other Gothic aspects of estate. One of few examples of flying buttresses used in garden buildings in Ireland.

As a result of the above study and available forensic evidence the most likely form was considered to be a cone.

The design below also gives some evidence for the likely form of the flying buttresses.



Langley, Batty, 1696-1751: *Ancient architecture, restored and improved by a great variety of grand and useful designs, entirely new, in the Gothick mode, for the ornamenting of buildings and gardens : exceeding everything that's extant, : exquisitely engraved on LXIV large quarto copper-plates and printed on superfine royal paper /* ([London : s.n., 1742]),

3.0 Condition of the building

Vertical cracks

The general condition of the folly is good, with well-prepared mortar and stonework substantially intact.

The stone voussoirs are in good condition generally to the gothic arched window openings.

The structure has suffered from Ivy establishment and dissolution of the mortar at the top of the walls due to exposure to rain and subsequent frost action.

This has resulted in the unfortunate deterioration to the stonework rubble masonry above eaves level, but the eaves cut stones remain in position

There is evidence that the copings to the buttresses are substantially missing and these will need to be restored as shown on the drawings.

The fireplace has been blocked up and the masonry surround required repairs.

The area around the folly required clearing and at this stage careful investigation for evidence of collapsed timber components and masonry can be carried out which may inform the detail of any proposed reconstruction.

It is suggested that the roof reconstruction should be carried out to protect the vulnerable stonework rubble masonry at the top of the folly as the photo beneath reveals.

Source Drone survey: Caimin O'Brien National Monuments 2018_1109

Rebuilding of sloping masonry and top levels of buttresses

These should be rebuilt in stonework in NHL 3.5 1 :2.5 lime mortar in accordance with the specification. In order to blend in with the general character of the ruin we have suggested adding a pigment to the mortar. Similar reconstructions were carried out recently under our supervision in Gloster House where the tip of the obelisks was constructed with a solid stone in order to preserve from the weather. We suggest a similar approach to the top of the pinnacles on the buttresses as the photo below shows:-

Suggested termination of top of pinnacles

Dissolution of mortar at tops of walls and on buttresses

The second concern is the deterioration of mortar and establishment of Ivy into the top of walls and at the sloping and horizontal surfaces of buttresses.

- Establishment of Ivy at the top of the wall where moisture content is high and root expansion causing mortar to crack and become displaced
- Frost action causing expansion and cracking of mortar
- Wetting and drying cycles and salt expansion causing crumbling of mortar

Even though stonework may be quite loose, it should still be feasible to deep point and grout in situ based on previous experience.

4.0 Recommendations

4.1 Ivy Growth and loose masonry at tops of walls and at buttresses

All ivy should be treated with 'Root Out' in accordance with the method statement. A brushwood killer should be applied in accordance with manufacturers recommendations during growing season, both in September. Once the foliage has absorbed the chemical, visible signs of the fact that the treatment is successful should be noticed and it will then be possible to cut back all the ivy growth down to the root structure and treat the roots. This involves roots embedded in masonry and those embedded in the ground. In the case of Ballycumber, the main Ivy establishment is at the top of the walls and it should be possible to remove Ivy from other areas quite easily. Once the root treatment has been completed, consideration can then be given to pointing remedials.

Masonry that is too loose to grout should be carefully removed and rebuilt. From a visual inspection this will be the exception rather than the rule and it is hoped that rebuilding would be at an absolute minimum.

4.2 Pointing and grouting regime for unstable masonry

Areas of masonry which have become unstable as a result of mortar dissolution will have to be deep pointed in a 1:2,5 NHL 3.5 Lime Sand mix using '*Ottobeim*' lime and Wexford sand. This should be mixed with a 5-7mm grit and pinning stones to match surrounding masonry. Mortar should be thoroughly pressed into gaps between stones with a timber rammer. It can be left slightly recessed and pigmented with Burnt umber to ensure a match to surrounding original pointing.

Once pointing both sides of masonry is complete, the grouting operation can be simply carried out using a Heritage lime grout, such as Coulinex. This grout is based on NHL3.5 with a compressive strength of about 3.5N/mm^2 and is considered compatible with the mortar. However, it can flow easily into voids in the structure. Coulinex, is based on NHL 3.5 with no cement or pozzolanic addition. It can be used on its own or with addition of sand, depending on the voids size. The water addition is dictated by the amount of Coulinex used and the fluidity required.

In choosing a grout, attention should be paid to its "stability". This is the property of the grout to retain unnecessary water (this is the water exceeding the amount required for hydration and fluidity) not allowing it to flow freely.

The manufacturer **St. Astier have** carried out tests to confirm the water cement ratio as follows: _

Mix	1:	water	ratio	0.875
Mix	2:	water	ratio	0.897
Mix	3:	water	ratio	0.93

Mix 1: no additions (Coulinex only) Mixes 2 and 3 are with addition of fine aggregates

Under no circumstances should the amount of water exceed the values in the above table which are in accordance with the manufacturer's recommendations.

Material may be introduced by gravity feed into funnels from a reservoir on scaffolding, or alternatively may be introduced with a small hand pump or syringe depending on the size of voids.

It is important to ensure that not too much pressure is provided which would cause the bursting of stonework and that enough pressure is provided to allow for full flow. Grouting points should be provided by PVC tube similar to garden hosing and these grouting points should be left during pointing operations.

Annual maintenance consisting of inspections, and vegetation treatment should be carried out after essential works are complete.

Once the masonry structure is complete, consideration can be given to roofing as shown in the specification methodology and drawings.

The following is a proposed schedule of work;-

1	Ground clearance and provision of gravel surface internally on *Terram 1000*
2	Scaffolding and access internally and externally
3	Consolidation of stonework at the top of walls
4	Scholarly reconstruction of buttresses as shown on the drawings
5	Isolated patch pointing using pigmented mix where structurally necessary
6	2 layers of wall plate fixed with M10@400 centres
7	6 Principal rafters and ties with secondary rafters
8	Curved battens, breathable felt and 3 layers of ply sheeting to top level
9	Specialist tapered slating as specification
10	Leadwork to LSA recommendations
11	Unblock fireplace and make good masonry

5.0 Conclusion

This report discusses a methodology for consolidation of the masonry of the folly which is likely to be cost effective.

A design for a slated cone roof is proposed, see drawings attached

These assumptions have been made on a visual inspection and works will have to be carefully supervised by Southgate Associates.

It is difficult to give an accurate budget on the basis of a visual inspection but an approximate budget for the works would be around €60-70,000 plus VAT and will ensure the long-term preservation of an important folly which may date from the 3rd quarter of the 18th century.

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Nov 2018

PHOTOGRAPHS

1. Approach to the folly from main house

2. Exterior stonework in reasonable condition. Area around to be cleared

3.1 The following photos are taken of the exterior clockwise

3.2

3.3

3.4

3.5

3.6

The stonework is found to be in good condition for a ruined folly but requires repair at eaves level and the top surfaces of the buttresses require rebuilding

4.Evidence that roof was slated.

5. Arch voussoirs in reasonable condition.

6. Ditto

7. Ditto

8. Entrance door.

9. Blocked up fireplace to be unblocked.

10. Some cills require minor rebuilding.

11. Close up of stonework.

12. Some consolidation to top 1m of stonework is required.

13. Sloping stonework appears to be missing from flying buttresses and requires restoration.

14. One buttress shows stonework above eaves and indicates that all buttresses would be at least as high.

14.1 View of highest buttress. Giving evidence that all buttresses were once well above eaves level

15. Evidence of previous sloping stonework is found in one location

15.1 Sloping masonry to bottom of buttress.

16. Typical window reveal implies working sash windows in the past.

17. Spalled masonry from the top of the walls