pwh
Conservation Consultants

Completion Report

for

Repair to Brickwork, Copings and Render to Garden and Hot House Walls

at

Pencarrow House
Washaway
Bodmin
Cornwall
PL30 3AG

for

The Trustees of the
Pencarrow Maintenance Fund

March 2016

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RICS

Introduction

PWH Surveyors were invited to tender for selected consolidation works at Pencarrow and to undertake the necessary surveys and management of the works. PWH Surveyors submitted their tender in early 2015 and were appointed on behalf of the Trustees in early April 2015 to undertake the Project Management works. The works undertaken by PWH have been in accordance with the Brief that was prepared by Ann Reynolds, Senior Archaeologists with Cornwall Council, dated 19th February 2015. A copy of the Brief is included within Appendix A of this report for information purposes.

Surveys

The initial survey work was undertaken on site by PWH Surveyors at the end of April 2015 with the surveys completed and drawn up in May 2015. A copy of the survey drawings that have been produced are lodged with this report and include:-

- Drawing No 099/15/001 – Existing garden walls – plans and elevations
- Drawing No 099/15/002 – Hot House walls – plans and elevations

The surveys included a full measured and topographical survey of the areas of the walls identified in the brief. The surveys allowed for a thorough visual inspection of the walls to be undertaken, but no destructive opening up works were undertaken as part of the initial survey work. The surveys revealed that most of the walls were in reasonable condition, although there was a large amount of plant growth to both the head and face of the stone and brick walls. The plant growth appear to be embedded into the head of the walls and the copings and the removal of this vegetation was seen as imperative to the future maintenance and safety of the walls.

The surveys also revealed two areas of wall that would require some degree of possible rebuilding due to the damage that was clearly visible. These two areas were as follows:-

Stone wall between bay 4 and 5 – it was clear that there was movement out of the vertical plane to this section of the wall. There had been movement which had led to the separation of the stonework on the junction of the wall and stone column, and it was possible that collapse had been prevented due to the buttressing effect of the concrete block structure on the rear of Bay 4. It was clear that there had possibly been some damage to the base of the wall and that careful dismantling of a section of the wall would be needed to allow for the wall to be rebuilt. It had been found on other similar projects that by careful removal of the original wall fabric it was possible to retain as much of the wall as possible and then stitch together the new and retained sections of the wall. The use of stainless steel twisted

bars within the walls and the bed joints as the wall is being rebuilt would also help to tie the two sections of wall together.

Hot House walls – in this area it was clear that a section of the adjacent to the Old Plant shop had been badly affected by the weather and plant growth. It was clear that a section of the brickwork in this area would need to be carefully removed and rebuilt with the reclaimed brickwork to leave the wall in a good and sound condition.

It was noticeable in the other areas of stone walls that the walls were generally found to be in good order with mainly the plant growth to the heads of the walls causing the main problem. The careful removal of the plant growth and the consolidation of the stone coping would help to safeguard the stone walls. There was very limited general stone repairs and repointing required to the other areas of the stone walls.

The brickwork walls were found to require a slightly more in the way of general repairs to the walls with areas of the lime pointing having failed and frost damage to several isolated bricks throughout the walls. A walkover survey of the walls was undertaken and notes on each individual bay were made of the number of bricks to be replaced, areas of repair and the areas of repointing required. This information was then used to inform the production of the Schedule of Works, which detailed the repairs on a bay by bay basis, with the bay numbers taken from the survey drawings.

The brickwork walls along the run from Bay 9 up to Bay 16 were noticed as having a significant lean in the walls at the time of the survey. The walls however appeared to be stable with no evidence of any movement of cracking at the time of the survey. The lean in the wall did not, in itself, appear to represent a threat to the structural condition of the wall as the centre of gravity of the wall was still within the centre third. The brick bond appeared to be in good condition and it was clear from the visual inspection that there were sufficient stretchers in the wall to from a good bond. The thought process was that as long as the wall was maintained and the plant growth removed from the head of the wall then the integrity of the wall should be maintained.

The information from the surveys was used as the basis for the production of the Schedule of Works that was agreed by all of the Stakeholders. The Schedule of Works and associated tender documents were issued to selected contractors in June 2015, with the successful Contractor Kingston Construction from Barnstaple being instructed in July 2015. The Contract period allowed for the works to start on site in August 2015 and be completed within a 14 week period.

The Works

The onsite works were commenced in August 2015 and Project Managed by PWH Surveyors in accordance with the terms of the brief. This involved regular site meetings to check the condition of the walls as the vegetation was being removed and to agree on any variations in the scope of the works. At the time of inspecting the works a full photographic record of before, during and after the works has been undertaken and these photographs are deposited with the as built record drawings.

The stone walls were found to be in remarkably good condition with limited work required to the walls, with generally the works being restricted to the head of the walls. It was found that the roots from the plants and vegetation on the head of the walls had spread along the top of the walls directly underneath the copings. It was therefore agreed that in the interests of restricting the future plant growth, there would be careful removal of the stone copings and removal of the vegetation with treatment of the heads of the walls before reinstating the stone copings.

The crack between Bay 4 and 5 was carefully taken down and it was found that the stonework in itself was in good condition. It was therefore agreed to try and retain as much of the historic fabric of the stone wall as possible and to minimise the amount of wall to be rebuilt. This approach allowed for a larger amount of the wall to be retained than had previously been envisaged. It was also found that at the base of the wall the ground was very soft and that this had probably contributed to the cracking and movement in the wall. A new stone foundation was built at the base of the wall and tied into the adjacent stonework with stainless steel twisted bars. The stone wall was then rebuilt with stainless steel bars inserted into the retained sections of the walls and the bed joints as the work proceeded, using where possible the retained stone work. This has allowed this section of wall to be rebuilt and tied back together, which is clearly shown on the recording drawings.

The brickwork walls running from Bay 9 to 16 were provided with scaffold on both sides and carefully had the vegetation removed from the head of the walls. It became apparent that on removal of the vegetation and plant growth that the wall was unstable and that large section of the pointing and mortar beds were coming away with the vegetation. It was therefore agreed that some additional buttress supports should be provided to the garden side of the wall to ensure the stability of the walls during the works. The long term stability of the wall was also a concern and it was agreed that initially the brickwork column between Bay 10 and 11 would be reduced down to the level of the stonework. It was hoped that by taking this down the column could be rebuilt incorporating stainless steel reinforcement to stiffen up the length of the wall. The column was supported and carefully taken down by hand, which then revealed a significant issue with the wall structure. The brickwork wall had

been built with predominantly snapped stretchers, which meant that effectively there were two separate leafs of brickwork with little tying the two together. In a normal garden wall the stretchers would be bonded across the two leaves of the wall providing a strong and uniform wall. In this situation the movement in the wall was exacerbated by the lack of full stretchers in the wall.

The original scheme of works had come in under budget and therefore there was the ability to undertake and complete the repair works to leave the long term future of the secure. It was therefore agreed that the best way forward was to remove completely the brick walls from Bay 9 and 10 and then gradually step back up with the wall over the remaining bays. This allowed for the wall to be carefully taken down by hand and the bricks salvaged for reuse in the wall, with the wall then being rebuilt with the correct bond. The main issue in rebuilding the wall is that due to the high number of snapped stretchers there were not enough full bricks that could be salvaged to rebuild the wall. It was therefore agreed that the salvaged bricks could be used on the inside face of the wall and the new handmade bricks used on the outside face. The new brickwork has been rebuilt incorporating stainless steel bars tying in with the existing wall and new bed reinforcement thus ensuring a full and stable wall for the future.

At the end of the main project works additional funding also allowed for a section of the kitchen garden wall to be consolidated. A brief evaluation of the walls were undertaken and it was agreed that the section that abuts onto the tennis courts was the wall in most need of repair. This section of wall had significant plant and vegetation growth and limited copings to the head of the wall. It was therefore agreed that the wall should be surveyed and that the scope of the works would be limited to the top 400mm of the wall. The brick and stonework should be stabilised the vegetation removed and a slate coping provided to the head of the wall. The slate coping projects at least 40mm past the edge of the wall and ensures that any surface water is taken away from the face of the wall. The head of this section of wall has now been stabilised and protected from further decay from water penetration.

The full extent of the repair works has been recorded and can be seen on the recording drawings or within the completion photographs that have been taken as part of this brief. The works broadly have followed the works detailed in the Schedule of Works with the main exceptions that have been noted above.

Maintenance

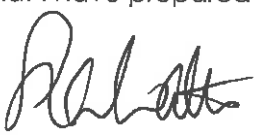
The ongoing maintenance and repair of the walls is essential to keep them in good order and preventing and undue damage from occurring. It is clear that the initial repair works for the first 12 months will be undertaken through the Building Contract, with any major items dealt with by the Contractor. There will however, be a need to continue and keep up to date with any repointing or isolated stone or brick repairs with lime mortar if a defect becomes evident.

The main issue in regards to general maintenance will be to prevent the plants and vegetation from growing on and within the walls again. I would therefore recommend that on an annual basis the walls are checked for any plant growth, if this is found it needs to be removed and the affected area treated to restrict the possibility of future plant growth. If this is kept up to date then this should protect the walls from further damage by plants or vegetation.

Specialist Reports

There were no ancillary reports undertaken as part of this Brief.

I certify that I have prepared this report



Signed .....

Shaun Watts FRICS FCIArb FCABE RMaPS

Certified Historic Building Professional

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Date: March 2016

Evidence of lack of stretchers to brick wall Bays 9 to 16

Re-construction of the brick wall with stainless steel reinforcement

Completed stitch repair to stone wall Bay 4 and 5

Completed garden wall Bay 9 to 16

Hot House Walls

BEFORE

AFTER

Old Plant Shop Walls

BEFORE

AFTER

Crack to Bay 5

BEFORE

AFTER

Bays 3 to 7

BEFORE

AFTER

Bays 9 to 10

BEFORE

AFTER

Head of Brick Wall

BEFORE

AFTER

Head of Stone Wall

BEFORE

AFTER

Bay 16

BEFORE

AFTER

Bays 30 to 32

BEFORE

AFTER

Bay 45

BEFORE

AFTER

Bays 52 to 53

BEFORE

AFTER

Kitchen Garden Walls

BEFORE

AFTER

Head of Kitchen Garden Walls

BEFORE

AFTER