

Project Ref: 22514

STRUCTURAL REPORT

ON: CONSTANTINE CHURCH HALL
FOR: CONSTANTINE PARISH COUNCIL
DATE: JANUARY 2022
PREPARED BY: M W PERRY B.Eng (Hons), MRICS, I.Eng,
AMIStructE



1.0 INTRODUCTION

- 1.1 M Perry Associates Ltd have been instructed to visit Constantine Church Hall in order to provide an inspection and report on the overall structural condition of the building as part of a pre-purchase process.
- 1.2 The inspection and report have been carried out in accordance with our Conditions of Appointment, a copy of which are attached.

2.0 GENERAL

- 2.1 The building was a single storey structure of solid natural stone construction with predominantly granite external walls and a pitched timber roof. A date plate was present indicating the building was constructed in 1864.
- 2.2 For the purposes of this report the ridge of the main roof is assumed to run east and west with the porch projecting out of the northern elevation onto the adjacent road.
- 2.3 It should be noted that this report is based on a visual inspection only, and no opening up work or intrusive investigations have been completed.

3.0 OBSERVATIONS

- 3.1 The building consisted of a main open plan hall measuring approximately 19.5 x 7m with a 2.5 x 3.6m porch projecting out of the northern elevation and a 2.1 x 3m extension containing WCs projecting out from the south elevation. To the west a 4.7 x 3.7m kitchen was present.
- 3.2 The eastern end of the main hall had a flat ceiling with the remaining three quarters of the building containing sloping sections of ceiling to the north and south to form a partially vaulted area. Due to the height of the roof no access was available into the loft spaces in order to inspect the structural condition of the roof trusses.
- 3.3 The partially vaulted section of ceiling was thought to be formed out of raised collar tie trusses spanning north to south between the external walls and a small section of the underside of the principal rafters was observed at the intersection between the flat and sloping sections of the ceiling spaced at approximately 2.5m centres.
- 3.4 The ceiling throughout the main hall was generally in reasonable condition with some damp staining noted but no signs of any significant cracking to indicate recent movement having occurred.
- 3.5 The internal face of the external walls to the main hall appeared to have been rendered with a cementitious material and damp staining was prolific throughout. The hall was unheated and unused at the time of our inspection and therefore a lot of moisture will be trapped in the building causing condensation however some of the stain patterns indicated water ingress, particularly around windowsills and the top of the northern elevation between the two windows to the west of the porch where a chimney stack projected up from the roof.
- 3.6 The staining to the northern elevation was significant and horizontal cracking of 1-2mm wide was noted to the top of the wall in this area. The wall below the chimney stack was checked with a spirit level and the top section was found to lean outwards by approximately 5mm per 600mm length and although the cracking was relatively minor the outward lean could be due to wind pressures onto the chimney stack.

- 3.7 A spirit level was used to check the verticality of the remaining walls of the main hall and although slightly uneven there were no signs of any significant inward or outward leans to indicate significant levels of roof spread which is common in buildings with raised collar tie roof trusses.
- 3.8 A spirit level was used to check the window sills throughout the main hall all of which appeared to be approximately level to within normal construction tolerances with no patterns of significant movement to indicate sub-structure issues.
- 3.9 The floor within the main hall was finished with timber boards with a cut-out noted to the southeast corner where the side entrance door was present that had a solid floor below. The timber boards were thought to have been built off of timber bearers which from the nailing patterns were thought to span north to south across the building.
- 3.10 The edges of the timber boards were darkened in some areas, particularly around the southwest corner and the centre of the southern elevation and it is likely that water damage has occurred to the timber bearers in these areas that will require remedial work to be undertaken. 4 no. vents were noted around the north elevation at floor level with a further four to the south. The vents were randomly spaced, and none were observed to the eastern end of the north side of the building.
- 3.11 The porch area had a solid concrete floor set slightly below the level of the timber finishes within the main hallway. The roof was formed out of scissor type timber trusses spanning east to west between the external walls supporting purlins with small common rafters above. The roof here appeared to be underlined with a bituminous felt and the roof was finished with a man-made type roof slate.
- 3.12 From our ground level inspection, the roof structure appeared to be in reasonable condition and only a slight outward lean was noted to the east and west walls with only 1-2mm wide cracking present therefore no signs of any significant roof spread.
- 3.13 The paint throughout the porch was in poor condition and had de-bonded around the base of the western wall due to damp issues and water spots were noted running along the threshold of the entrance into the main hall having dripped down from above. The moisture was not thought to be due to a leak to the roof but condensation build-up to the section of wall above the door having dripped down. The walls were streaming with condensation at the time of our visit which was a very damp and rainy day.
- 3.14 There were two steps down into the WC extension to the south and again the head and sill of the window was level and the external walls approximately vertical with no signs of any significant recent cracking although damp issues were prolific throughout.
- 3.15 The roof over the WC was a monopitch structure spanning downwards away from the building towards the south and no significant deflection was noted to the ceiling. The floor was finished with ceramic tiles laid onto a concrete floor slab.
- 3.16 The kitchen to the west of the main hall was aligned to the northern elevation but stepped in to the south. The ceiling within this section of the building was flat and again no safe access was available into the loft space.
- 3.17 Damp staining was noted around the chimney stack to the western elevation, particularly at ceiling level, and damp staining was noted around the top half of the southern external wall.
- 3.18 There were no signs of any significant cracks or recent movement in the kitchen area and the walls were vertical to within normal construction tolerances.

- 3.19 What appeared to be a timber suspended floor was noted within the kitchen area and this was finished with sheet vinyl.
- 3.20 Externally the building was finished with exposed natural granite with large, coursed cut stones and granite lintels above the window and door openings. Cut granite detailing was present around some of the windows and the bases of the walls stepped out slightly from the external line of the walls above.
- 3.21 The external walls were pointed with what appeared to be a cement-based mortar and this appeared to have been patched up on multiple occasions over the building's past. The pattern of some of the more recent pointing would indicate some former cracking to the centre of the eastern elevation as well as to the western side of the north gable of the porch area. The pattern of the pointing would indicate some thrust type movement having occurred to the roof within this area.
- 3.22 The northern elevation of the main hall had a chimney stack measuring approximately 600 x 600mm on plan extending up from the roof pitch by in excess of 4m. The stack was too high to check with a spirit level however appeared to be generally vertical with no signs of a significant lean when sighted through from ground level. The stonework to the top of the northern wall below the chimney stack had several eroded joints present and some evidence of patch repairs having been undertaken to the pointing.
- 3.23 It should be noted that the rainwater goods throughout the building were in very poor condition being a mixture of uPVC and cast iron, many of the cast iron sections were completely rotten and all of the gutters were in need of significant maintenance work. The roofs were finished with what appeared to be a man-made slate with some moss growth over the main hall. The roof over the kitchen area appeared to be in better condition and possibly replaced more recently. A corrugated metal roof was present over the WC block extension.
- 3.24 To the southern side of the building again cementitious pointing had been undertaken and there were no signs of any significant movement or cracking to the main external walls. The WC projection had been finished with a cementitious render to its eastern elevation and a short lean-to store had been constructed from single leaf blockwork to its southern side. The western elevation of the WC projection was exposed granite stonework not to the same quality as the main original hall with brickwork reveals to each side of the window and a concrete sill.

4.0 CONCLUSIONS

- 4.1 Damp issues were present in multiple locations and will need to be investigated further with remedial action taken. Due to the presence of timber floor and roof structures some damage may have been caused where water ingress has been ongoing for some time, particularly around the centre of the south wall of the main hall and the west end of the kitchen.
- 4.2 Condensation was prolific throughout the building but it was unheated at the time of our inspection and understood to have been empty for some time. The internal faces of the external walls were finished with what appeared to be a cementitious plaster and cement had been used in many area of repointing outside. Solid natural stone walls should have breathable materials applied to them such as lime-based mortars and renders to allow moisture to escape. If moisture becomes trapped in walls it can damage the stonework and also increases damp levels inside the building. In this case the walls were predominantly granite, which is a very hard stone, and therefore there were no signs of damage having been caused as it may have been with a softer sedimentary stone.

- 4.3 We would recommend that all cementitious materials are removed both internally and externally and a lime based mortar used to replace them. Insulated lime plaster could be considered internally in order to try and retain some heat within the building and to limit condensation.
- 4.4 A detailed inspection of the roof was not possible; however, the roof lines were relatively straight and level and there were no signs of significant recent movement from inside. The roof finishes were also in reasonable condition and didn't appear to be in need of immediate replacement, however, maintenance and partial replacement of the rainwater goods, barge boards etc will need to be considered. A closer inspection of the roof finishes are recommended and the building is likely to require re-roofing in the next 5 years or so.
- 4.5 Consideration should be given to removing the tall brick chimney to the north side of the main hall. It did not appear to have moved significantly but it was noted as being very slender and damp issues were present below.
- 4.6 The external walls were not suffering from any significant cracking at the time of our inspection, although, there was evidence of some scarring from crack repairs in the past. This was generally around the porch area where some historic roof spread appeared to have occurred. This type of movement happens when truss members are inadequately sized to resist the loads applied to them and this causes some lateral movement to occur around eaves level. Poor fixing down of the trusses can also contribute to the issues.
- 4.7 The scarring from repaired cracks had not reopened at the time of our inspection, and they did not appear to be recent repairs. The movement is likely to be historic, however, some thought should be given to roof strengthening and repair when the finishes are next replaced.
- 4.8 In summary, the building did not appear to have suffered from any significant recent structural issues. Maintenance is required in multiple locations throughout the building, and solid masonry structures such as this should be kept heated and ventilated in order to limit damp issues. Upgrading is required to the thermal envelope of the building if it is to be successfully used in the future at all times of year, and as part of the maintenance work it is likely that some sections of the building, particularly timber floors and roofs, will require some structural repair.



SIGNED:

DATED: 12th January 2022

APPENDIX A

PHOTOGRAPHS



Figure 1 – Cement pointing noted in multiple locations.



Figure 2 – Roof coming to end of natural life. Very high chimney to north side of building.



Figure 3 – Evidence of historic repairs and possible movement to porch area.



Figure 4 – Main hall.



Figure 5 - Damp issues and cracking around base of north chimney.



Figure 6 - Rot to floor around centre of south side of main hall.



Figure 7 - Rotten floor boards to west end of kitchen.



Figure 8 - Significant damp staining to tops of kitchen walls.