Simon Bastone Associates Ltd

Consulting Civil and Structural Engineers

Structural Inspection

Inspection of Steel Portal Framed Building for Permitted Development at

Prospect Farm,
Launcherley,
Wells,
BA5 1QJ

For Pete and Georgina Dickens

Reference R230817/SI/Rev 1

15 December 2023

Units 4 & 5 The Boat Shed
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1 INTRODUCTION

1.1 Scope of Investigation

1.1.1 I (Robert Thomson) have been instructed to produce this report for and on behalf of Simon Bastone Associates Ltd.

1.1.2 It is proposed to convert this agricultural barn into a dwelling under Class Q of the Town & Country Planning (General Permitted Development) Order 2015 (Amended), hereafter the Regulations. Our instruction is to carry out an inspection of the existing structure and report on the nature of construction, suitability for incorporation within the conversion and condition.

1.1.3 My brief for this investigation is to carry out a visual inspection of the finishes of the structure and report on any relevant defects that could reasonably be observed within the limitations of the investigation outlined below.

1.1.4 My brief is to consider whether the existing structure complies with Approved Document A of the Building Regulations taking into account the loading which comes with the external works for conversion to residential use.

1.2 Limitations of the Investigation

1.2.1 Certain limitations apply to the inspection and this report. These limitations are detailed in my Terms and Conditions of Engagement. Please ensure that these limitations are fully understood before relying on any information contained in this report.

1.2.2 We will inspect as much of surface areas as is practical, but will be under no obligation to inspect those areas of the structure that are covered, unexposed or are not readily accessible. We are therefore unable to report that any such parts of the structure are free from defect.

1.3 Authorisation

1.3.1 The investigation on which this report is based was carried out in response to an email instruction from the Clients to proceed with the work.

1.4 Use of the Report

1.4.1 This report shall be for the private and confidential use of the Client for whom the report is undertaken, and shall not be reproduced or copied in any way in whole or in part or relied upon by third parties for any use without the express written permission of Simon Bastone Associates, the copyright owner. However, the report may be shown to other professional advisors such as Planners, Architects, Solicitors or sources of finance such as banks and building societies that may require knowledge of its recommendations for your benefit. It may not be passed to future purchasers or investors.

1.4.2 Also see our Terms and Conditions of Engagement.

1.5 The Investigation and Weather

1.5.1 The investigation was undertaken by Robert Thomson, on behalf of Simon Bastone Associates Ltd. on 7th September 2023. The weather at the time of the survey was sunny.

1.6 The Surveyor's Qualifications and Experience

1.6.1 I graduated from The University of Cape Town in 1983 BSc Civil Engineering and I am a fully qualified Chartered Engineer (CEng).

1.6.2 I have been a Member of the Institution of Structural Engineers (MIStructE), achieving chartered status, since 1995. I have worked in a senior position since then, which has provided me with extensive experience in the construction industry.

1.6.3 I have considerable experience in surveying both modern and older structures, including buildings of great historic interest. With a background of structural design, extensive knowledge of modern and historic construction techniques and the building regulations, this is the ideal experience to carry out this type of survey work.

1.7 Photographs

1.7.1 A photographic record was taken, which is held in my records, from which a selection is appended to this report. Photographs generally relate to the text in the preceding paragraph.

1.8 Descriptions

1.8.1 For the purpose of identification of parts of the structure, the front is taken to be the wall facing the access drive and the right or left hand side gable walls would be taken when looking towards the structure from the outside at the front.

1.8.2 Descriptions of individual walls or elevations are taken when looking at the wall from the relevant side.

2 CONSTRUCTION

2.1 General Description

2.1.1 The building is a single storey steel framed duo-pitched roof barn. There are three bays at approximately 4.6m centres. There are three columns within each frame with a row of columns along the ridge line.

2.1.2 There is a blockwork masonry duo-pitched roof extension to the front left side of the barn.

2.1.3 Historical aerial photographs (earliest 1964) indicate that the original building was a curved roof 'Dutch' barn between the left side two columns with an attached lean-to roof to the right side. The current structural arrangement predated 2009 as the duo-pitched roof building can be seen on google street view at this date.

2.1.4 It is evident that the three original columns and right side rafter members were retained with the curved roof trusses and roof covering removed. Then the left side row of columns were cut down and a new steel rafter installed over the top of these columns and fixed to the flange of the internal row of columns.

Aerial photo (courtesy of client) taken after 1964 showing building to right hand end of yard

2.1.5 All the columns and rafters are a minimum 152 x 76 UB steel sections. The rafters are fixed to the flanges of the central columns. The rafters are fixed to a capping plate to the right and left side columns other than the rear left corner column where the rafter is fixed to the inside face of the column.

2.1.6 There are central steel wind posts within the front and rear walls each side of the central columns.

Internal view looking towards rear gable wall

2.1.7 There is a full width vehicular access opening to the right side of the central column within the front wall. To the left side of the wind post, the wall consists of blockwork masonry up to the verge of the attached masonry extension. Between the central column and wind post there is a masonry wall to three courses. Above the masonry the wall consists of painted box profile steel sheeting. There are two glazed openings within this sheeting.

2.1.8 The right side wall consists of externally painted corrugated steel sheeting. The sheeting is supported by steel angle rails spanning between the columns. There are double access sliding doors (steel framed and clad with externally painted corrugated steel sheeting and compatible opaque sheeting) within the central bay that are fixed in position. There is a substantial beam supporting the sliding doors that will be retained within the conversion.

2.1.9 The rear wall consists of shallow box profile steel sheeting to the right of the central column and corrugated steel sheeting to the left side. All the sheeting

is painted. The sheeting is supported by steel angle rails spanning between the columns and wind posts.

2.1.10 The left side wall consists of blockwork masonry to just below eaves level. There is an original pedestrian doorway infilled with blockwork masonry within the last bay. Above the masonry there is painted box profile steel sheeting.

2.1.11 There is an internal blockwork masonry wall that it is proposed to be retained within the conversion.

2.1.12 The roof structure consists of steel angle purlins to the right side of the central columns and pressed steel Z section purlins to the left side. The roof is covered with painted box profile steel sheeting.

2.2 Foundations

2.2.1 The foundations and the subsoils were not observed, although generally for this form of construction the steel columns and posts are set into concrete pad foundations and masonry walls on strip foundations formed on an adequate bearing strata.

2.2.2 From my experience of buildings of a similar age and form of construction the minimum viable (practical to excavate to depth required and install columns) pad foundation dimension is 600mm x 600mm on plan.

2.2.3 Assuming a minimum allowable bearing capacity (100 kN/m^2) these foundations are therefore capable of supporting a working load of 36 kN. This load is significantly greater than the existing applied roof loading to the central columns (less than 20 kN).

Front elevation

Rear and part right side elevations

Right side elevation

3 OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

3.1 Superstructure

3.1.1 There is no evidence of any damage or significant corrosion within the steel framework. The low levels of surface corrosion can be readily cleaned off with paint treatments applied, as would be completed during routine maintenance works, at the conversion stage.

3.1.2 The existing building is clad to three elevations with 50% infilling to the front. The access void is therefore a dominant opening. There will therefore be no increase in lateral wind load when the building is converted.

3.1.3 The masonry walls to the perimeter of the steel frame and extension, plus the internal wall, is to be retained within the conversion. The masonry walls provide enhanced resistance to lateral wind loading.

3.1.4 As there is no increase in lateral wind loading to the building, it could be deemed to satisfy Approved Document A of the Building Regulations.

3.2 Roof

3.2.1 The structural steel roof purlins are in a reasonable condition as is the roof covering with no signs of significant corrosion or water ingress.

3.2.2 It is intended to retain the profile roof sheets. As there would be no increase in loading, the existing roof structure would be deemed to satisfy Approved Document A of the Building Regulations.

3.3 Exterior walls

3.3.1 There is evidence of damage to the non-loadbearing masonry above the lintel to the original pedestrian door (now infilled with blockwork masonry) within the left side wall. This appears to be due to corrosion within the now redundant lintel. It is recommended that the lintel is removed with the masonry repaired during the conversion works.

3.3.2 It is intended to line the perimeter walls with insulation to conform to Approved Document L of the Building Regulations.

3.3.3 All glazing and doors are to be set within the existing sliding door, glazed openings and front vehicular access openings.

3.3.4 Where existing openings are infilled, the timber framing will be detailed to be supported by the existing foundations.

3.4 Foundations.

3.4.1 The existing foundations will be reused to support all the loads from the proposed conversion.

3.4.2 Taking the minimum capacity of the existing foundations into account, the calculated capacity of the existing foundations will not be exceeded by the applied loading which comes with the external works for conversion to residential use.

4 CONCLUSION

4.1 Feasibility for Conversion

4.1.1 It is my opinion that it is feasible to convert the building and to retain the existing structure for support.

4.1.2 The existing structure complies with Approved Document A of the Building Regulations taking into account the loading which comes with the external works for conversion to residential use. The building structure is therefore understood to comply with the requirements within Class Q.