



## STRUCTURAL ENGINEER'S REPORT

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**Site Address:** Shaw Farm, Orton Lane, Orton On The Hill, Atherstone, CV9 3NW

**Project No:** 251006 Rev1

**Client:** Mr J. Hemmings

**Date of Inspection:** 4<sup>th</sup> December 2025.

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Weather: It was a mild day with rain showers. Temperature: 11°C

1. **BRIEF**

2. This report is a Structural Engineer's Report on the general structural condition of the building and the suitability of the building for the proposed redevelopment into a residential dwelling.

3. **USE OF REPORT**

4. This report is for the use of Mr J. Hemmings for the purpose of assessing the structural condition of the building for the purpose of submitting a Planning Application.
5. This report is to be used for no other purpose than that stated above, without express permission, **in writing**, from BK Consultants Ltd.

6. **EXCLUSIONS**

7. This report does not deal with dry rot, wet rot, rising damp, or infestation of timbers. These items should be dealt with by other specialist companies.

8. **ASBESTOS**

9. This report does not deal with asbestos; specialist asbestos companies carry out such surveys.

10. **CONTAMINATION**

11. We have not been instructed to carry out any investigation into past or present uses of the property or of any neighbouring land to establish whether there is any potential for contamination from these uses or sites to the subject property and therefore have assumed that none exists. However, should it be established subsequently that contamination exists at the property or on any neighbouring land or that the premises have been or are being put to any contaminative use, then this may reduce the value of the property and may effect remedial costs.

12. **INTRODUCTION**

13. The inspection has been limited to the structural fabric of the building only.
14. This document does not contain any valuation nor likely cost of any necessary remedial works.
15. We have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are, therefore, unable to report that any such part of the property is free from defect.

16. This document is for the specific use of the aforementioned Client, and shall not be disclosed to other parties without full written consent of the Engineers.
17. This document is issued only to the persons stated above, and on the understanding that this Practice is not held responsible for the actions of others who obtain any unauthorized disclosure of its contents or place reliance on any part of its findings, facts or opinions, be they specifically stated or implied
18. **MOVEMENT**
19. This document cannot categorically state that movement has ceased or that no movement has taken place without monitoring the property for a minimum period of one year.

20. **REFERENCE DOCUMENTS**

21. Appendix A: Alder Mill Drawings

- Drg No. 642/225/01 dated November 2025.
- Drg No. 642/225/02 Site Location Plan dated November 2025.
- Drg No. 642/225/04 Existing Structural Frame dated November 2025.

22. Appendix B: Corrosion protection: Steel Construction.

23. Appendix C: Galvafruid.

24. Appendix D: BK Consultants Ltd Structural Analysis of Existing Building Structure.

25. Appendix E: BK Consultants Ltd Structural Analysis of Proposed Building Structure.

26. Appendix F: BS.EN.1991-1-1-1:2002 Eurocode 1: Action on Structures Part 1.1:  
General Actions - Densities, self-weight, imposed loads for buildings.

27. Appendix G: BK Consultants Ltd Drawings:

- 251006-01-01: General Arrangement Existing Line Diagram Sections
- 251006-01-02: General Arrangement Existing Line Diagram Sections
- 251006-01-03: General Arrangement Proposed Line Diagram Sections
- 251006-01-04: General Arrangement Proposed Line Diagram Sections

28. **BRIEF DESCRIPTION OF PROPERTY**  
(All heights, sizes and dimensions given are approximate)



Fig 1

29. Fig 1 is a general view of the front of the building.
30. The building is an enclosed steel framed agricultural building. There are no internal partition walls.
31. **CONSTRUCTION OF BUILDING**  
(All dimensions and sizes quoted are approximate)
32. Floor: The internal floor is constructed from '6F2'. The steel building is approximately 18.6 x 7.6m in plan.
33. Steel Frame: The building is supported on 5 No. structural steelwork portal frames. The columns are 178 x102 universal beams (UB) and roof trusses are arched steel roof trusses with the following construction.
- Top Chord: Structural Steelwork angle 80 x 80 x 6mm (d x b).
  - Internal Chord: 45 x 6mm steel plate.
  - Bottom Chord: 75 x 6mm steel plate.
34. The eaves and ridge joints have a combination of rivet and bolt connections or bolts only at the joints
35. Walls: The side and rear walls are profiled and clad with steel sheets supported on 80 x 80 x 6mm structural steelwork angles.
36. Roof: The roof is clad with a corrugated steel sheet supported on 80 x 80 x 6mm structural steelwork angles.

37. FOUNDATIONS



Fig FO1



Fig FO2

38. Fig FO1 shows the encased concrete columns on concrete pad foundations. The concrete pad foundations are approximately 0.7 x 0.7 x 1.0m length x breadth x depth (l x b x d)

39. Fig FO2 shows structural steelwork columns encased in a 450mm thick concrete retaining wall.

40. BRACING

41. There is no wall or roof bracing.

42. DRAINAGE

43. Plastic gutters and downpipes.

44. **BRIEF DESCRIPTION OF FAULTS**  
(All heights, sizes and dimensions given are approximate)

45. **EXTERNAL**

46. **FRONT ELEVATION 1: NORTH EAST**



Fig FE1

47. Fig FE1 is a general view of the front elevation.

48. **SIDE ELEVATION 1: NORTH WEST (SE1)**



Fig SE1.1

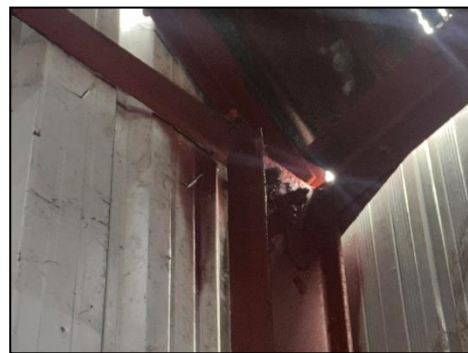


Fig SE1.2

49. Fig SE1.1 is a general view of side elevation 1 (SE1).
50. Fig SE1.2 shows a typical truss/column joint (See Appendix A GP1E: Steel column Drg No. 642/225/01).

51. REAR ELEVATION: SOUTH WEST



Fig RE1.1

52. Fig RE1.1 is a general view of the rear elevation.

53. SIDE ELEVATION 2: SOUTH EAST (SE2)



Fig SE2.1

54. Fig SE2.1 is a general view of side elevation 2 (SE2).

55. **GROUND FLOOR PLAN**



Fig GF1



Fig GF2

56. Fig GF1 is a view towards the rear corner (See Appendix A GP1A Drg No. 642/225/01) and shows the 80 x 80mm structural steelwork angle cladding rails.

57. Fig GF2 is a view towards the rear corner (See Appendix A GP1A Drg No. 642/225/01).



Fig GF3



Fig GF4

58. Fig GF3 shows the side wall on the north west (Side elevation 1).

59. Fig GF4 shows the side wall on the south east (Side elevation 2).



Fig GF5

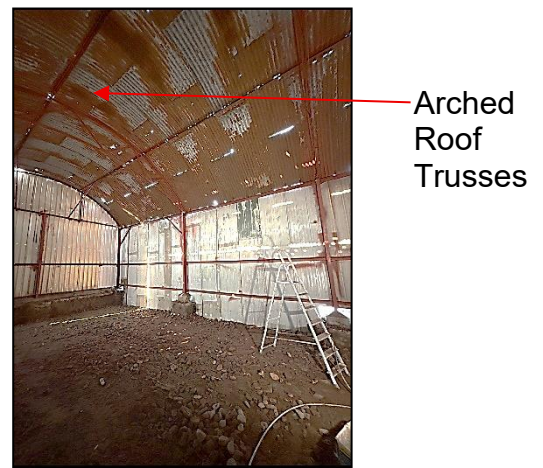


Fig GF6

60. Fig GF5 shows the typical inclined angle support for the top internal cladding rail on the side wall (SE2).

61. Fig GF6 shows the arched roof trusses that support the roof.



Fig GF7



Fig GF8

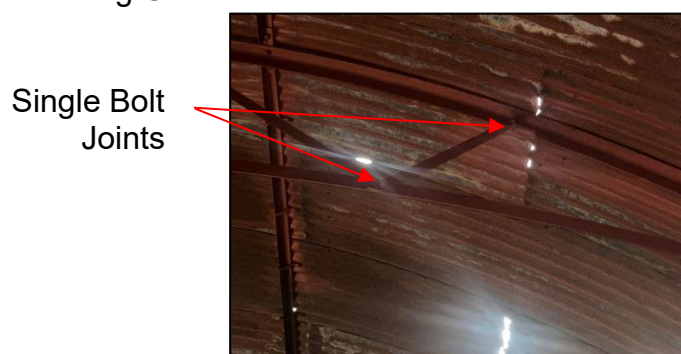
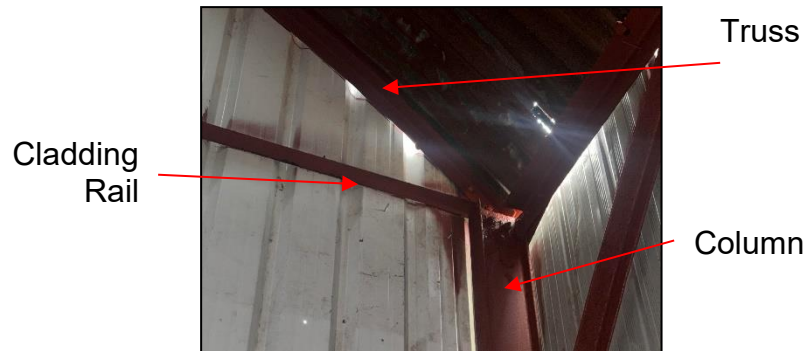


Fig GF9

62. Fig GF7 shows a typical column to cladding rail joint.

63. Fig GF8 and Fig GF9 show the single bolt truss joints.



64. Fig GF10 shows a typical corner column/ roof truss/ cladding rail joint.

65. **STRUCTURAL STEELWORK: ANALYSIS**  
(See Appendices D and E)

66. A three dimensional structural analysis of the existing and proposed structural steelwork frame has been carried out in accordance with the following codes:

- Dead Loads: BSEN 1991-1-1-2022 Weights of Building Materials.
- Live Loads: BSEN 1991-1-1-2002: Loadings for Buildings.
- Wind Loads: Wind Tunnel Simulation. Wind Loads have been applied in the North, South, East and West Directions.
- Design of Structural Steelwork: EC3 (EN1993) Design of Steel Structures.

67. The building has been analysed for the following loads.

- Dead Load (DL)
- Live Load (LL)
- Wind Load (WL)

68. The following loading combinations have been analysed:

- Dead Load and Live Load.
- Dead Load and Wind Load. (Applied from North, East, South and West directions).
- Dead Load and Live Load and Wind Load. (Applied from North, East, South and West directions).
- Accidental Damage.

69. **EXISTING BUILDING: ANALYSIS**  
(See Appendix D)

70. The analysis for the existing building showed that the displacement for the building under the combined loading conditions is within the code limits.

71. All of the structural steelwork is satisfactory and within the code requirements, the calculations show the existing structural steelwork frame is stable and can carry all of the applied load combinations.

72. PROPOSED BUILDING: ANALYSIS  
(See Appendix E and G)
73. A three dimensional structural analysis of the existing and proposed structure was carried out in accordance with the following codes:
- Dead Loads: BSEN 1991-1-1-2022 Weights of Building Materials.
  - Live Loads: BSEN 1991-1-1-2002: Loadings for Buildings.
  - Wind Loads: Wind Tunnel Simulation. Wind Loads have been applied in the North, South, East and West Directions.
  - Design of Structural Steelwork: EC3 (EN1993) Design of Steel Structures.
74. The building has been analysed for the following loads.
- Dead Load (DL)
  - Live Load (LL)
  - Wind Load (WL)
75. The following loading combinations have been analysed:
- Dead Load and Live Load.
  - Dead Load and Wind Load. (Applied from North, East, South and West directions).
  - Dead Load and Live Load and Wind Load. (Applied from North, East, South and West directions).
  - Accidental Damage.
76. The results show that the frame is stable and can carry all of the applied load combinations.
77. The structural steelwork frame is within the code requirements and requires no further bracing or strengthening for the proposed General Arrangement of the building.

78. **GENERAL COMMENTS ON CONSTRUCTION**

79. **STRUCTURAL STEELWORK**

80. The structural steelwork frames are in a good condition. The visible structural steelwork has been coated with a protective red oxide paint. The structural steelwork frames can carry the existing and proposed loads.

81. Where there are hidden areas of structural steelwork (i.e. behind existing cladding). These areas may have surface corrosion, the steelwork is to be cleaned off and coated with FOSROC Galvafruid (OSA) paint. (See Appendix C).

82. **DRAINS**

83. The existing roof structure appears to drain into the ground.

84. **CORROSION OF STRUCTURAL STEEL**

85. *"The corrosion of structural steel is an electrochemical process that requires the simultaneous presence of moisture and oxygen. In the absence of either, corrosion does not occur. Essentially, the iron in the steel is oxidised to produce rust, which occupies approximately 6 times the volume of the original material consumed in the process.*

*As well as general corrosion, there are various types of localised corrosion that can also occur; bimetallic corrosion, pitting corrosion and crevice corrosion. However, these tend not to be significant for structural steelwork.*

*The rate at which the corrosion process progresses depends on a number of factors relating to the 'micro-climate' immediately surrounding the structure, principally the time of wetness and the atmospheric pollution level. Because of variations in atmospheric environments, corrosion rate data cannot be generalised. However, environments can be broadly classified, and corresponding measured steel corrosion rates provide a useful indication of likely corrosion rates. More information can be found in BS EN ISO 12944-2[1] and BS EN ISO 9223[2]".*

86. The corrodibility category and risk for this site can be categorized as C2 medium.

87. "Atmospheric corrosivity categories and examples of typical environments (BS EN ISO 12944-2[1])

| <b>Corrosivity category and risk</b> | <b>Low-carbon steel Thickness loss (µm)<sup>a</sup></b> | <b>Examples of typical environments in a temperate climate (informative only)</b>                                                                |                                                                                                                       |
|--------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|                                      |                                                         | <b>Exterior</b>                                                                                                                                  | <b>Interior</b>                                                                                                       |
| C1<br>very low                       | ≤ 1.3                                                   | -                                                                                                                                                | Heated buildings with clean atmospheres, e.g. offices, shops, schools, hotels                                         |
| C2<br>low                            | > 1.3 to 25                                             | Atmospheres with low level of pollution<br>Mostly rural areas                                                                                    | Unheated buildings where condensation may occur, e.g. depots, sports halls                                            |
| C3<br>medium                         | > 25 to 50                                              | Urban and industrial atmospheres, moderate sulphur dioxide pollution<br>Coastal area with low salinity                                           | Production rooms with high humidity and some air pollution e.g. food-processing plants, laundries, breweries, dairies |
| C4<br>high                           | > 50 to 80                                              | Industrial areas and coastal areas with moderate salinity                                                                                        | Chemical plants, swimming pools, coastal, ship and boatyards                                                          |
| C5-I<br>very high (industrial)       | > 80 to 200                                             | Industrial areas with high humidity and aggressive atmosphere                                                                                    | Buildings or areas with almost permanent condensation and high pollution                                              |
| C5-M<br>very high (marine)           | > 80 to 200                                             | Coastal and offshore areas with high salinity                                                                                                    | Buildings or areas with almost permanent condensation and high pollution                                              |
| CX extreme                           | >80 to 700                                              | Offshore areas with high salinity and industrial areas with extreme humidity and aggressive atmosphere and sub-tropical and tropical atmospheres | Industrial areas with extreme humidity and aggressive atmosphere                                                      |

**Notes:**

- 1µm (1 micron) = 0.001mm
- The thickness loss values are after the first year of exposure. Losses may reduce over subsequent years.
- The loss values used for the corrosivity categories are identical to those given in BS EN ISO 9223[2].
- In coastal areas in hot, humid zones, the mass or thickness losses can exceed the limits of category C5-M. Special precautions must therefore be taken when selecting protective paint systems for structures in such areas"

88. **RECOMMENDATIONS**

89. The drainage points around the building are to be exposed and checked to trace all drainage runs.
90. If a drainage system is in place, a camera survey of the drains should be carried out.
91. All broken, cracked or leaking drains are to be replaced.

92. **STEELWORK**

93. To be cleaned of all rusted areas and repainted.
94. All corroded areas to be sandblasted and cleaned off to a Sa 2½ - very thorough blast cleaning (See Appendix B: P.4). All loose material is to be removed and steel is to be sandblasted, primed and painted (See Appendix C: Table 1).

95. **GALVAFROID**

96. Fosroc Technical Department have informed us that 2 coats of galvafroid (grey in colour) applied onto bare metal gives a coating of 30μ (μ micros) of zinc. If an aggressive corrosion of 1.3μ/ per annum (pa) is assumed then a life expectancy of 25 years can be expected for exposed steel. This may be extended by the application of alkyd based overcoat paints and either FOSROC (OSA) specialist paint supplier can advise on this. The steelwork will be inside the building and its life will, therefore, be in excess of 25 years.

97. **CLADDING**

98. The wall and roof cladding as stated in BSEN 1991-1-1-2002 (Cl 5.1. item 3: See Appendix F) is a non-structural element and can be replaced with a new profiled steel sheet.

99. **CONCLUSION**

100. Further investigations are to be carried out as outlined in the recommendations of this report.
101. The structural steelwork frame is suitable for renovation and refurbishment into a residential dwelling, no additional bracing or strengthening of the existing structural steelwork frame is required for the renovation of this building.



**Bogdan Kuncewicz**  
**BEng, CEng, MICE, MIMunE, MStructE**

24<sup>th</sup> March 2026

**LEGEND**

|        |   |                                      |
|--------|---|--------------------------------------|
| AB     | : | AIR BRICK                            |
| BB     | : | BLACK BOLT                           |
| CB     | : | CHIMNEY BREAST                       |
| C/c    | : | CENTRE TO CENTRE                     |
| CL     | : | CENTRE LINE                          |
| D/P    | : | DOWN PIPE                            |
| DPC    | : | DAMP PROOF COURSE                    |
| DPM    | : | DAMP PROOF MEMBRANE                  |
| G      | : | GULLEY                               |
| GD 4.6 | : | GRADE 4.6 : GRADE OF BOLT BEING USED |
| GL     | : | GRID LINE                            |
| GP     | : | GRID POSITION                        |
| H/L    | : | HAIRLINE CRACKS                      |
| IL     | : | INVERT LEVEL                         |
| M      | : | METRES                               |
| MH     | : | MANHOLE                              |
| MM     | : | MILLIMETRES                          |
| OSA    | : | OR SIMILAR APPROVED                  |
| SVP    | : | SOIL AND VENT PIPE                   |
| UON    | : | UNLESS OTHERWISE NOTED               |

## DISCLAIMER

This report has been prepared in good faith and intends to provide an overview of structural form, condition, and defects at the property. However, the observations and defects recorded are based on a visual report only i.e. no intrusive investigations have been carried out. It is recommended that any formal quotations to undertake any potential repair work include provisional sum amounts to account for any unseen or unrecorded condition items. The Contractor should satisfy himself that the full scope of works has been understood. Should the Contractor require an accompanied site visit then please contact the report writer.

We have assumed that all necessary permanent planning and other permissions, approvals and consents, have been obtained for the construction and current use of the premises, and that there are no outstanding enforcement or other notices. Non-compliance with any statute or statutory regulations has not been established.

This report does not deal with asbestos; specialist asbestos companies carry out such surveys.

This report is in respect of the buildings construction, repair, and maintenance; we have not considered nor investigated any aspects of the premises which are likely to be affected by mining or tunnelling operations, or by current environmental legislation. We have not instigated or carried out searches with the National Coal Board or prepared an environmental audit of the premises drainage or land.

We have not inspected woodwork or other parts of the structure which are covered, cladded, unexposed or inaccessible, and we are therefore unable to report that any such part is free from rot, beetle or other defects that may exist, or to confirm the adequacy of any structural element or foundation, or soil/ground conditions.

The presence or absence of high alumina cement, calcium chloride, asbestos, or permanent woodwool shuttering, fibre reinforced concrete, alkali silica reaction, sea dredged aggregates, or any other deleterious materials within the premises has not been determined.

We have not carried out detailed examinations or testing of the ventilating, heating, cooling, electrical and electronic, drainage or mechanical services installations.

We have not been able to ascertain whether or not any structural repairs have been carried out, including timber treatment, underpinning and strengthening works, nor have we determined whether or not any guarantees exist.

We have not been able to ascertain whether or not the property has ever been flooded or be likely to be affected by flooding in the future.

We have not been able to ascertain the existence of any concealed access hatches or voids.

We have not been able to ascertain any information in respect of any dispute or claim with neighbours or neighbouring properties.

We have made no investigations with any public Local Authority or statutory undertaker to ascertain whether or not there are any current notices or proposals affecting the property.

This report is confidential to the parties to whom it is addressed and whose name appears at the beginning of this report. Neither the whole nor any part shall be disclosed to any other party and no reference thereto may be included in any circular or statement, nor published in any way, without the written approval of BK Consultants Ltd