End Barn, Ivy Farm
Heaton, Macclesfield

Sine Aequalis

Structural Condition Report
May 2016
Project 16040
Revision 02



REVISION HISTORY

Rev00	10th May 2016	Draft Issue
Rev01	11th May 2016	2nd draft issue
Rev02	13th July 2016	Final issue

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EXECUTIVE SUMMARY

1. The integral barn end of the main outbuilding range at Ivy Farm is in a dilapidated condition, and will need some careful stabilising works in order to save and reuse the main elements of the superstructure. This is however considered both feasible and economic.

2. In order to enable any reuse of this part of the outbuilding, a level floor slab needs to be provided. At present there is no floor as such, with the internal space consisting of bare earth dropping southwards following the natural slope of the adjacent land. The new floor slab could be cast integral with reinforced concrete underpins to form a raft which functions also to stabilise and tie in the existing walls. Ideally the west elevation edge of the new raft slab should be stiffened by the insertion of a full upstand wall to reflect the east and south elevations.

3. Components which can be retained and reused in their current locations include the east and south walls, tubular steel roof posts and brackets, and possibly the main central roof rafter. The mono-pitch galvanised corrugated roof sheeting and timber purlins require replacement.

SCOPE AND LIMITATIONS

- This report, which is intended to support a new Planning Submission following Refusal Notice DET/2015/0043 (dated 24th December 2015) has been prepared for the sole use of Mr and Mrs S Heath, Red Earth Farm, Macclesfield Road, Leek, ST13 8PT and their subsequent, authorised agents. It should not be relied upon or used by any unauthorised third parties, and Sine Aequalis Ltd can take no responsibility for such subsequent use, or reliance. Additionally, by receiving it and acting on it the client, or any third party, accepts that no individual is personally liable in contract, tort or breach of statutory duty including negligence.

- The findings are taken from a walk round inspection carried out on 26th April 2016. The weather for the survey was dry and cloudy with sunny spells.

- The inspection is based on a limited knowledge of the history and maintenance of the building. No supporting documents confirming the age and full details of the construction of the building were made available. Much of the building structure is however visible.

- No special access equipment was used and no intrusive opening up to view critical structural details was carried out.

- The survey is limited to the main structure of the building and is intended to look at any major structural issues which might affect the proposed conversion works for use as a lounge room at the end of the outbuilding block. The survey does not include roof coverings, guttering, cladding, secondary fixings, windows, doors, and any other items of a non-structural nature.

INSPECTION FINDINGS

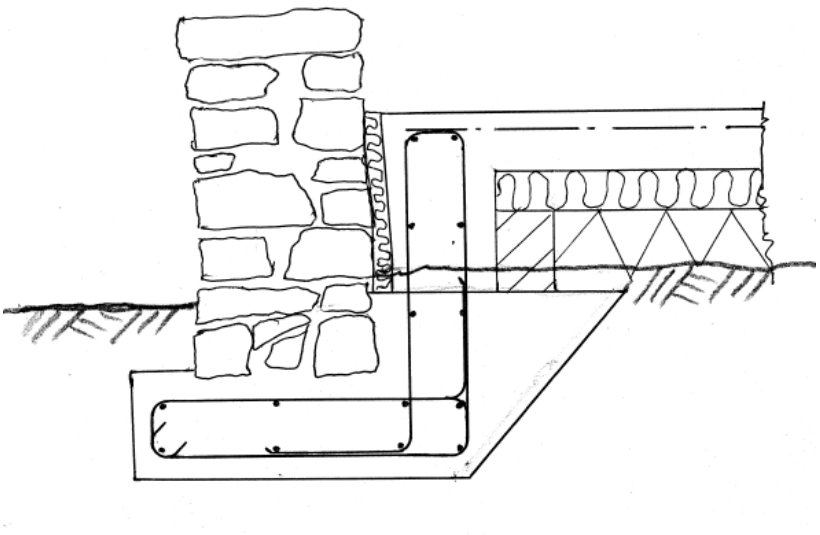
1. FOUNDATIONS AND SUBSTRUCTURE

There are main walls to the barn end on the east side (the rear wall), the north side (the link to the range of the farm outbuilding), and the south side. The west side is essentially open to ground level with just a small return pier at the south west corner. The rear and end walls have been toed into the ground at shallow depth. During the history of the barn end these walls will have moved with thermal and moisture changes in the ground, such that the mortar joints have been repeated flexed. Ground level differences, and surcharges due to possible agricultural storage of materials have led to lateral loads being applied to the walls causing cracking, distortion and out of plumbness. For the height and proportions of the walls this is not considered serious, and they remain fundamentally stable.



Exposed footing at the south east corner – the walls are founded at shallow depth

Possible new level floor option section which incorporates discrete RC underpins into a rafted slab solution. This would stabilise the walls and ensure that the whole structure worked as a single monolith. This could further be enhanced by the provision of a stiffening wall on the west side of the building.



2. LOADBEARING MASONRY WALLS



The solid loadbearing stone masonry walls are of stocky and robust proportions. The main linking wall to the north is in good condition with sound pointing. The remaining rear and south end walls are out of plumb. In order to retain the walls they will need the joints raking out to remove vegetation, and repointing using a suitable lime mortar mix.

Internal view of the end wall. The open joints require re-pointing once the walls have been stabilised.





Outward lean of the rear wall as viewed from the north east corner – for the height and proportions of the wall this is not considered serious. It could either be left as current or partially corrected by judicious “eccentric undermining” of the walls during the underpinning works. Such a technique has been used on the tower at Pisa.

3. ROOF STRUCTURE

The corrugated steel roof is supported on timber purlins which are over-spanned and sagging. The roof sheets are corroded and require renewal. The single central timber rafter appears in reasonable condition and proportions. It might be feasible to reuse this, subject to the new roof form and loadings, and an assessment of its load carrying capacity.



Sagging purlins along the front edge of the roof. The 2 tubular steel posts on the west elevation could be reused, subject to a detailed inspection and assessment of any corrosion. The corner post at least has rusted through near to the base. This could be cast into a new reinforced concrete surround for increased strength and future durability. The posts should also be sealed to prevent ingress of moisture, blast cleaned and repainted.