

Your Ref: *Ben Dalton 11/10/05*

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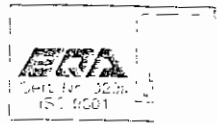
27<sup>th</sup> February 2005



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Structural Inspection of  
Existing Barns  
Sampson Street, Eastoft.  
for  
Ben Bailey Homes Limited



1.0 Brief

- 1.1 We were commissioned on 15th February 2005 by Ben Bailey Homes Ltd. to carry out a structural inspection of the existing barns at their Sampson Street development, Eastoft, for and on behalf of Ben Bailey Homes Ltd.
- 1.2 We visited the property on 23<sup>rd</sup> February 2005. The weather at the time of the survey was cold with frequent snow.
- 1.3 This report is issued subject to our standard 'Limitations of Inspection' attached as Appendix 'A' to this report. This survey was carried out on behalf of Ben Bailey Homes Ltd and no liability is accepted to any Third Party for all or part herein other than those listed above.
- 1.4 In this report RHS and/or LHS refers to right hand side and left hand side of the property when viewed from the front.
- 1.5 External observations were made from ground level only.

## 2.0 Observations – External:

- 2.1 The property consisted of two single storey detached farmyard barns. The barns were constructed in close proximity to each other to form an 'L'. The age of the buildings was difficult to determine, however they may date to the beginning of the 19<sup>th</sup> century or earlier.
- 2.2 This was a predominantly level site.
- 2.3 The roof covering consisted of clay pan tiles which appeared in reasonable condition. There were some small areas where tiles were missing and occasional loose/ slipped tiles were noted.
- 2.4 The ridge line was uneven with much sagging and the pointing was in poor condition. Ridge tiles appeared loose.
- 2.5 There was some evidence of slight roof spread.
- 2.6 Rainwater goods consisted of part UPVC, part iron and part asbestos.
- 2.7 UPVC rainwater goods appeared recent and were in good condition.
- 2.8 Cast iron and asbestos rainwater goods were generally in poor condition, with weathering, corrosion and occasional broken and leaking gutters observed.
- 2.9 The rainwater down pipes were discharging onto the hardstanding.
- 2.10 Rainwater guttering was absent to the LHS of the smaller barn, causing water to run off directly onto the wall / hardstanding, causing wetting and staining.
- 2.11 Soffit & fascia boards were not apparent except to the RHS of the smaller barn. Where observed fascias were in poor condition. Defects noted were – flaking / cracked paintwork – rotten timber.
- 2.12 The buildings were constructed from solid brickwork which varied in thickness from 100mm to 330mm. Bricks were irregular sized hand made clay in a lime based mortar.
- 2.13 All bricks exhibited signs of very severe weathering and spalling.
- 2.14 Mortar joints were very severely weathered. Depth of mortar loss into the wall was up to 70mm in some areas.
- 2.14.1 Mortar loss had resulted in some areas of masonry becoming very loose.
- 2.15 Lintel construction to the smaller openings consisted of shallow brick arches to the external face with timber lintels behind. There was some cracking above lintels and movement to the arches.
- 2.16 Lintel construction to the large openings consisted of large timber beams which were warped and sagging. Cracking up to 20mm wide was noted above the lintels and local to the bearings.

- 2.17 The majority of external walls were out of plumb. The direction of lean varied and was severe in some areas.
- 2.18 There was significant severe bowing / bulging to the rear elevation of the larger barn.
- 2.19 The gable panel to the rear elevation of the smaller barn was severely distorted.
- 2.20 Multiple vertical, horizontal, stepped and diagonal cracking, up to 20mm wide, was noted to the walls in several areas.
- 2.21 There was no evidence of any form of damp proof course.
- 2.22 Existing timber window and doors and their frames were extremely dilapidated, defects observed were – paint absent, severe wet/dry rot, insect infestation.
- 2.23 Some door frames appeared badly distorted.
- 2.24 Some walls to the smaller barn appeared to have been rebuilt.
- 2.25 The front (gable) elevation of the smaller barn was rendered to full height. Defects observed to the render were: cracking, spalling and blown areas.
- 2.26 Masonry had been pushed outward local to ground level in the RHS elevation of the smaller barn.
- 2.27 Pattress plates were occasionally observed to the rear elevation.
- 2.28 Paving around the property was too high in relation to the finished floor level.
- 2.29 Paving around the property was not inspected due to a cover of snow.
- 2.30 Manhole covers were not observed.
- 2.31 A large group of semi-mature deciduous trees/ shrubs (possibly birch) were observed in very close proximity to the LHS elevation of the smaller barn.

### 3.0 Observations – Internal

- 3.1 The roof spaces were open without ceilings or ties, the underside of the rafters being visible from ground level.
- 3.2 Roof construction consisted of king post trusses at regular centres with loose rafters over purlins between.
- 3.3 King post trusses incorporated iron rods through the central post, typically rod ends and washer plates were corroded.
- 3.4 The roof tiles were fixed to timber battens via sand/cement fillets, which appeared in poor condition.
- 3.5 There was evidence of rot and insect infestation to roofing timbers.
- 3.6 Rafters had been repaired in some areas by splicing on new sections.
- 3.7 Floors were of solid construction typically cobbled, except for a small area local to the smaller barn front elevation which was insitu concrete construction.
- 3.8 The floors were typically uneven with substantial hollows in some areas.
- 3.9 Internal walls were of solid brick construction of varying thickness. Some walls were not bonded to the external walls.
- 3.10 Timber lintels were rotten and sagging with some cracking noted to the brickwork above.
- 3.11 A steel beam was noted over the large opening to the rear elevation of the smaller barn. Steelwork was rusted and in poor condition.
- 3.12 Multiple vertical, horizontal, stepped and diagonal cracking, up to 25mm wide, was noted to the walls in several areas.

#### 4.0 Conclusions/Recommendations

- 4.1 The buildings are very severely dilapidated. Renovation is likely to involve extensive works to stabilise, and strengthen the existing structure.
- 4.2 The buildings exhibit signs of differential movement of the foundations in several areas. The cracking / movement typically has an historical appearance. However we suspect the movement local to the LHS of the smaller barn may be ongoing. Confirmation of ongoing movement or otherwise could only be given after a period of monitoring. The existing foundations may be inadequate and further investigation and design work by a suitably qualified Structural Engineer is recommended.
- 4.3 Tree root damage may be a factor. We would recommend the removal of the trees/shrubs local to LHS of the smaller barn. However, care should be taken not to undermine the foundations to the building.
- 4.4 All roofing timbers should be inspected by a specialist timber preservation company and the necessary treatment / repairs carried out by specialist contractor. The existing roof structure offers little restraint against roof spread, may not be of sufficient strength to support a replacement roof covering, and is unlikely to comply with Building Regulations. We recommend the existing roof structure is checked by calculation and, if necessary, a strengthening scheme implemented.
- 4.5 All timber lintels, door and window frames are rotten beyond repair and should be replaced. Care should be taken to avoid collapse when removing lintels, particularly the larger sections local to the gable walls. Shallow brick arches are unlikely to be adequate, particularly if the roof covering is replaced. New lintels should incorporate a plate or similar to support the external face.
- 4.6 Masonry is very severely weathered. Extensive repointing is required throughout, however care should be taken to avoid destabilising the walls during any raking out, as bricks are liable to become dislodged. Repointing should be carried out using sand/lime mortar to maintain appearance. Some cracking may require specialist repair incorporating stitching with stainless steel rods etc. We recommend a specialist repair contractor be consulted. The existing brickwork appears highly porous and the spalling is likely to be an ongoing problem. We would recommend considering a proprietary sealant under specialist advice, or applying a protective cementitious render throughout.
- 4.7 Masonry panels are inadequately buttressed and suffering from a lack of restraint. A remedial restraint system should be included as part of the renovation works. The system should be designed and detailed by a qualified Structural Engineer. Masonry expansion joints are not present and may be required to prevent thermal cracking should the buildings be converted to domestic use. The installation of remedial expansion joints should be designed and detailed by a qualified Structural Engineer and carried out by a specialist contractor.
- 4.8 Existing walls and floors do not meet current requirements for damp proofing and thermal insulation. The renovation scheme should include for sufficient works to bring the buildings up to current standard, specified by a competent Architect or similar.
- 4.9 Existing cobble floors appear to have settled and should not be relied upon for supporting a new floor construction. Concrete floor slabs have suffered from sulphate

attack. We would recommend all floors are removed and replaced with a suitable damp proof, insulated sulphate resistant solution.

4.10 The roof covering requires repair / replacement.

4.11 Rainwater goods are dilapidated and should be replaced. Surface water / foul drainage was not observed and may require installation.

5.0 Notes to Developers

5.1 Foundations may be inadequate with suspected ongoing movement. The cracking should be monitored and/or suitable stabilisation should be implemented.

5.2 The floors have settled and suffered from environmental attack, they should be removed and replaced.


5.3 The walls have suffered excessive deflection, weathering, settlement, shrinkage and lintel failure. Suitable stabilisation schemes and remedial works are required.

5.4 The roof structure has suffered from extensive damp and infestation specialist advice should be sort from a BWPDA approved contractor.

The roof structure is unlikely to be sufficient to support new coverings and linings. This should be checked by calculation in light of BWPDA report and strengthened accordingly. Roof coverings are at the end of their life and require replacement.

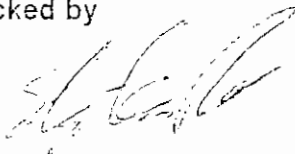
5.5 Extensive works are required (as for all conversion) to bring the building up to the current standards for habitable accommodation.

For and on behalf of Joynes Pike & Associates



N J James IEng AMIStructE  
Consultant

Checked by



S Peck BEng (Hons)  
Principal Engineer

## Appendix A

### Limitations of Inspection Schedule

JPA LIMITATIONS OF INSPECTION SCHEDULE

CLIENT : Ben Bailey Homes Ltd  
PROJECT NUMBER : 12050046  
SUBJECT PROPERTY : Existing Barns, Sampson Street, Eastoft.  
TO BE INSPECTED : Visual Structural Inspection of Property

(Excluding valuation and any specialist tests).

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- 1.0 During our inspection of the premises as presently existing, which will normally be carried out in a single visit, we shall check all visible exposed and accessible elements of construction in order to identify defects and shortcomings which are likely to adversely affect the use of the property or give rise to expenditure in the future. We shall consider the condition and durability of the building fabric in relation to the type and age of the property, the need for repairs or special maintenance and, where appropriate, comment on the suitability of the structure for its proposed use.
- 2.0 We shall, where possible, lift loose laid floor coverings and inspect cellars and roof voids where appropriate, but we shall not empty the contents of any fitted cupboards, move heavy furniture or lift carpets or floorboards and our report will specifically exclude all covered, and unexposed or inaccessible areas and buried elements of construction such as foundations and built in steels and timbers. Apart from any balconies and roofs to which external access may be available, our external inspection will be carried out from ground level. Our report will include a summary of our findings in respect of any outhouses and boundary walls etc. which will be inspected briefly during our visit. In accordance with our professional indemnity insurance cover we have to state that "we have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report any such part of the property is free from defect".
- 3.0 We will not arrange for exposure works to be carried out to the superstructure or below ground, or carry out tests for high alumina cement concrete, calcium chloride, asbestos or the use of woodwool slabs as permanent shuttering, but where appropriate will seek further instructions for these to be carried out for an additional charge.
- 4.0 With regard to service installations, incoming mains, waste and drains, we shall report on any matters which come to light during our inspection as requiring further investigation by specialists, but we shall not arrange for tests to be carried out unless specifically instructed beforehand.

Continued.....

- 5.0 Although where appropriate we will be happy to examine any lease or title documents, planning or any consents or fire certificates which are made available prior to our inspection, we shall assume in such cases that solicitors will be advising in detail upon these matters and that they will also check on the responsibility for the maintenance of all boundaries and rights of way and the existence of any easements or necessary rights of light, drainage etc.
- 6.0 We require to be informed, in advance of any work by us, of the positions of any underground services or plant beneath the site. Whilst reasonable care will be taken during the execution of the field work we cannot accept liability, either direct or consequential, for the damage to any service not clearly identified to us.
- 7.0 Our written report will be addressed and forwarded to the undermentioned Client, marked 'Confidential'. Any liability which may arise from its contents will be specifically restricted to the Client.