

**Structural Appraisal Report on**

**The Engineering Offices at  
Fole Dairy  
Uttoxeter Road  
Uttoxeter  
Staffordshire ST14 5EH**

July 2011

Report No. R11-1862

**Prepared For:**

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# **C O N T E N T S**

1. Terms of Reference and Introduction
  2. Location and Description of the Building
  3. External Observations – East Building
  4. External Observations – West Building
  5. Internal Observations – East Building
  6. Internal Observations – West Building
  7. Conclusions
  8. Recommendations
  9. Exclusions
- Appendix A: Photographs

## **1.0 Terms of Reference and Introduction**

- 1.1 Francis Bradshaw Partnership were commissioned by The Co-operative Estates Property Department to undertake structural appraisal of the Engineering Offices Building at Fole Dairy, Uttoxeter following concerns about the condition of the building fabric and structure. The appraisal and this report will also provide comment on the remedial work required to redevelop the building for future use.
- 1.2 The appraisal and this report are based on a visual inspection of the building on the 7th July 2011 when the weather conditions were a combination of sunshine and heavy rain.
- 1.3 The appraisal was a non-intrusive appraisal using binoculars where necessary and a vehicle mounted cherry picker to inspect roof areas and upper levels of the building. Vehicle access to the rear of the building was not possible.
- 1.4 The appraisal did not involve any opening up of the structure, strength assessment of materials or foundation and ground investigations.
- 1.5 The appraisal did not include the use of optical surveying equipment as part of a “line and level” assessment of the building.
- 1.6 This report is for the sole use of The Co-operative Estates and their professional advisors. Francis Bradshaw Partnership accept no responsibility of whatever

nature to any third party acting on the contents, conclusions and recommendations of this report and no liability whatsoever for hidden or latent defects within the existing construction.

## **2.0 Location and Description of the Building**

2.1 The building is situated on Fole Lane north of the River Tean and forms part of a relatively small complex of adjoining buildings which include the Engineering Stores Building, Canteen Building and a Cottage at the south east corner of the Fole Dairy site.

2.2 For identification purposes the front elevation facing Fole Lane is assumed to face North with all other elevations referenced accordingly. Where the terms “right hand” or “left hand” are used, this assumes the reader is facing the element being described.

2.3 The property is bounded on four sides with Fole Lane to the North, the Engineering Stores Building to the East, the Cottage to the South and the Canteen Building to the West.

2.4 The property is rectangular on plan and formed by two different building configurations. For the purpose of this report they have been separated into the **East** and **West** buildings.

2.5 The East Building is two storeys high with an estimated construction date of mid 19th Century. The loadbearing walls are solid brickwork which support concrete and timber floors and three bays of dual pitched tiled roofs.

- 2.6 The West Building is three storeys high with an estimated construction date of mid 19th Century. According to a stone plaque on the north elevation, the building was destroyed in a fire in 1894 and rebuilt in 1897. It is unclear whether the whole building was destroyed or just the upper sections
- 2.7 The loadbearing walls are generally solid brickwork built partly off lower semi basement walls of brickwork and stonework. These support a dual pitched tiled roof incorporating an extended timber sided loft at the northern end.
- 2.8 Internally the ground floor is concrete (assumed to be ground bearing) and the upper floors are generally timber boarding supported on a variety of timber or steel beams onto loadbearing walls and occasional circular steel and cast iron columns. Some of the upper timber floors have been screeded over whilst some areas of floor appear to have been replaced with modern precast and insitu concrete.
- 2.9 The roof structure consists of timber trusses and composite steel and timber trusses supporting timber purlins. The roof slopes are under-drawn with a plaster finish.
- 2.10 The support to the loft structure is a bolted composite timber framework.

### **3.0 External Observations – East Building**

- 3.1 **East Elevation Overlooking the Loading Dock:** The elevation features twin gable walls of solid brickwork with feature brick string course verges. The first floor window openings have brick segmental arches. The timber window frames are decayed. There is an industrial sized door opening at ground floor/loading dock level.
- 3.2 The walls were reasonably plumb with no evidence of any foundation settlement or ground subsidence. There was old stepped cracking in the brickwork from the bottom left corner of the left hand first floor window cill.
- 3.3 The brickwork was in poor condition. There are many frost and impact damaged areas of bricks throughout and the original pointing is poor. Extensive re-pointing has been carried out in the past which does not match the original.
- 3.4 There appears to have been a previous building attached to this elevation with the lower areas of wall having been painted and the end of former steel beams have been cut off but left in the wall. There are also various services and fittings attached to the wall.
- 3.5 The rainwater goods are a mixture of original and modern plastic pipes. The downpipe and hopper from the valley gutter appear to be original but have been leaking for a long time with vegetation growing out of the brickwork around the

- hopper and moss growth and excessive dampness to the face of the brickwork below.
- 3.6 At the south corner the concrete frame of the Engineering Stores Building was built into the gable wall brickwork where the roof slope has been cut back. There is no outlet or guttering and the flashing and roof edge are in poor condition.
- 3.7 **North Elevation Facing Fole Lane:** The wall was constructed in solid brickwork and contains window openings at ground and first floor levels with brick segmental arch lintels above. A feature brick string course runs along the top of the wall forming the eaves.
- 3.8 The wall was reasonably plumb with no evidence of any significant structural movement.
- 3.9 There were some frost damaged and patched areas of brickwork and evidence of two former beams having been built into the wall. The pointing was generally poor.
- 3.10 **South Elevation:** This elevation was only partly visible from the passageway between the Engineering Stores Building and the Cottage. Part of the wall was damp due to a leaking gutter. Also the end concrete frame of the Engineering Stores Building is built into the corner of the wall.

**3.11 Roof:** The three dual pitched roofs were in reasonable alignment apart from minor undulations in the ridges. Several of the roof tiles have slipped and/or broken and the mortar bedding to the “V” ridge tiles was missing at many locations. The valley gutters were partially blocked and the verge mortar pointing is missing in several places.

#### **4.0 External Observations – West Building**

- 4.1 **North Elevation Facing Fole Lane:** The wall was constructed in solid brickwork and contains loading doors at ground and first floor levels and three windows, one at each floor level. The window openings contain glazed timber frames and have segmental brick lintels above.
- 4.2 The ground floor loading door was a modern steel roller shutter. The brickwork around the opening was impact damaged and the brickwork above the steel beam lintel was loose and displaced. A previous loading door has been bricked up at second floor level.
- 4.3 The wall was reasonably plumb with no evidence of any significant structural movements but there are several frost damaged bricks and the lower two thirds of the wall has been re-pointed in the past. The upper third of the wall appears to be more recent construction and could have been part of the rebuilding in 1897.
- 4.4 **East Elevation Overlooking the Roof of the East Building:** Only small triangular sections of the wall are visible. There were some frost damaged bricks and the pointing was poor. There is no evidence of any significant structural cracking or movement.

- 4.5 **West Elevation Overlooking the Canteen Building:** The wall was constructed in solid brickwork and contains three window openings; two at first floor level and one at the ground/lower ground floor. Above the windows are segmental brick arch lintels. A previous opening partly visible above the Canteen roof has been bricked up.
- 4.6 The wall was reasonably plumb and has had a painted finish to parts of the lower areas in the past when it would appear that there was a previous building on the site of the existing Canteen. The lower part of the building wall at the southern end was acting as a retaining wall to the surrounding ground.
- 4.7 The top few brick courses of the wall appear to be more recent construction than the remainder/lower parts of the wall. Again this may reflect that only the upper part was rebuilt in 1897.
- 4.8 There was some old cracking to the brick lintel over the ground/lower ground window but there was no evidence of any recent structural movement.
- 4.9 **South Elevation Facing the River Tean:** The wall was constructed in solid brickwork and contains two windows; one at first and one at second floor level and an entrance door at ground floor level. The wall alignment was satisfactory with no evidence of any recent significant structural movement.

- 4.10 The brickwork above the first floor window cill up to the verge appears to be more recent construction similar to the west and north walls. Again this may reflect that only the upper part was rebuilt in 1897.
- 4.11 The lower part of the wall is thicker than the upper parts and has a splayed capping. The mid to lower parts of the wall have been painted previously and appear to have been the internal wall of a previous building within the present courtyard. The brickwork was in poor condition with many frost damaged bricks and weathered pointing.
- 4.12 The brickwork in the corner adjacent to the Cottage wall was wet probably due to overflow from the guttering of the Cottage.
- 4.13 **Roof:** The main roof and slopes are uneven and there were numerous slipped and broken tiles and mortar missing from some of the ridge tiles and the verges. The gutter on the west side serves a single downpipe which is insufficient for the size of roof. Also the gutter has deflected and is leaking. In addition the gutter on the east slope is broken and only serves one downpipe which again is considered to be inadequate.
- 4.14 The loft extension timber louvred panels are showing signs of rot and the whole structure slopes in a southerly direction towards a noticeable sag in the main roof.

## 5.0 Internal Observations – East Building

- 5.1 **Ground Floor Room:** The ground floor room has a concrete (assumed ground bearing) floor with a slightly raised area at the northern end. The floor has a painted finish and there were some old cracks present. Along the east wall there was a service duct built within the floor depth which at the time contained standing water. A flight of steel stairs lead up to the first floor adjacent to the east wall.
- 5.2 **First Floor:** On the first floor were several partitioned offices. The floor construction was a mixture of timber and concrete supported on steel beams. The concrete surfaces were cracked in several places. There was no evidence of any undue deflection of the floors and no significant structural cracking to the walls.
- 5.3 Lower parts of the timber roof trusses were exposed within the office area which are supported at the valley positions by steel beams. No structural defects were observed.
- 5.4 There was some damp penetration through the under-drawn timbered ceiling and timber decay where the eaves meets the passageway to the Cottage and also adjacent the concrete frame to the Engineering Workshop Building.

## 6.0 Internal Observations – West Building

6.1 **Ground/Lower Ground Floor:** This area was accessed through a door off the small rear courtyard and was inspected by torchlight. The floor was concrete (assumed ground bearing) with a painted finish. There were several old cracks and some unevenness in level but overall the floor was satisfactory. There were manholes set within the floor indicating the presence of underground drainage below the building.

6.2 The perimeter walls were a mixture of stone and brickwork construction and were affected by penetrating damp particularly through the retaining wall sections. There was no significant structural cracking in the walls.

6.3 Four circular cast iron/steel columns on raised plinths support the first floor primary timber beams where alterations to the floor have taken place in the past. The remainder of the first floor is supported on primary timber beams. There is a longitudinal split in one of the beams at the north end.

6.4 There was a modern blockwork built store room and a small partitioned office within the ground floor. There were no significant structural defects.

6.5 **First Floor Room:** The floor has a cement based wearing screed on top of timber boards which span onto primary timber beams. There were two timber posts and one circular cast-iron/steel column supporting two of the second floor primary timber beams. The central section of one beam is missing and replaced

with timber boards. The second beam has had the side cut away reducing the width of the beam and a circular column has been installed. One of the beams has been scarf jointed and bolted and there appears to have been a column/post removed from beneath the joint. There were longitudinal splits in the sides of some of the primary timber beams. Also the circular column was loose and not fixed at the base.

6.6 **Second Floor Room and Loft:** This room is accessed by ladder through a hole in the floor. The main roof structure is exposed and consists of a combination of timber trusses and composite timber and metal trusses supporting timber purlins. The roof slopes are underdrawn and have a plastered finish. The floor is timber boarded.

6.7 At the northern end there are two built up timber frames which support the extended loft. These frames have been structurally altered with the central horizontal rail having been replaced with a loose fitting metal strap in one case and one of the horizontal rails removed in the other. The northern most frame has different sized posts; one being a single piece of timber and the other made up of three separate pieces of timber. The cross beam/rail has little or no support/bearing onto the post.

6.8 The timber frame posts of the second frame in from the northern elevation are not positioned directly above the primary beam of the floor. The loads have been

transferred from the posts to the beams by installing additional timber spreaders laid on top of the floor and bolted down where possible.

- 6.9 Several of the timber purlins have deflected between the timber trusses causing the splice joints to rotate and open.
- 6.10 The main roof trusses appear satisfactory but the apex of the composite trusses do not extend up to the ridge and may have been retrofitted to provide additional support to the deflected purlins.
- 6.11 The extended loft could not be inspected but there was evidence of damp penetration.
- 6.12 There is diagonal cracking in the painted brickwork at the bearing of the fourth truss on the north wall and evidence of previous cracking at other truss bearings, which have been painted over.

## **7.0 Conclusions**

7.1 The property was designed and has been used for industrial purposes throughout its life. In overall terms the building is fairly robust which is often the case in buildings of this age. There is no evidence of any foundation settlement or ground subsidence affecting the building but there are numerous superstructure and building fabric defects which need to be addressed before the building can be redeveloped and brought back into occupation.

7.2 The main structural defects include:-

- a) Removal and alterations to structural members from the loft timber support frameworks
- b) Sagging of the roof due to the extended loft and alterations to the supporting structure
- c) Excessive deflection of roof purlins
- d) Removal of sections of some of the primary timber floor beams
- e) Removal of circular cast iron/steel columns from below timber beams
- f) Circular cast iron/steel column not fixed to the floor structure
- g) Longitudinal cracking in timber floor beams
- h) Cracking to brickwork at roof truss bearing positions
- i) General cracking to brickwork

7.3 The main building fabric defects generally include:-

- a) Slipped and broken roof tiles
- b) Missing pointing to sections of the roof ridges and verge
- c) Defective rainwater goods and blocked gutters
- d) Timber and weatherproofing defects to the extended loft
- e) Decaying timber window frames
- f) Frost and impact damaged brickwork and poor quality pointing
- g) Areas of flaking and weathered external painting of brickwork
- h) Excessive damp in parts of the walls with vegetation and moss growth
- i) The concrete frame of the Engineering Stores Building has been built into and incorporated into the east boundary/party wall and the roof flashings/weatherproofing is in poor condition
- j) Cracking and partial failure of cement based screeds over timber floors
- k) Old/redundant fixtures attached to or built into the walls
- l) Loose and displaced brickwork above the roller shutter door on the North elevation of the West building
- m) Damp penetration through the lower ground retaining walls
- n) Open drainage and service channels in the floor
- o) Raised area of concrete ground floor
- p) Possibly unsealed manholes in the concrete ground floor slab

The items listed in Sections 7.2 and 7.3 should not be considered as exhaustive but are an indication of the defects which will need to be addressed.

## **8.0 Recommendations**

8.1 Based on the structural and building fabric defects, the following is the likely extent of the works required to bring the property back into a condition suitable for redevelopment and reoccupation:-

- a) Strip off all roof coverings and remove rainwater goods. Replace roof coverings using original tiles including new battens, insulation and finishes. Renew all rainwater goods and replace or re-line valley gutters including all flashings
- b) Carry out a measurement survey and structural assessment of all roof timbers in the West building and carry out structural repairs to the timber frameworks and loft extension
- c) Carry out repairs to primary timber floor beams and re-fix column/post supports
- d) Repair cracks to brickwork and replace all frost and impact damaged bricks
- e) Remove old paintwork from face of walls and redundant fixtures and make good walls
- f) Remove all vegetation and moss growth from walls
- g) Carry out damp and timber survey and treat areas affected. Check and install where necessary new damp proof courses
- h) Provide damp proofing to lower ground floor retaining walls

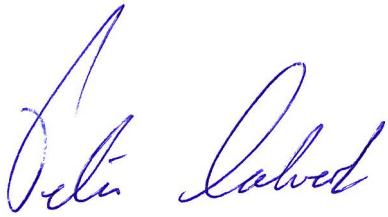
- i) Remove cement based screeds from timber floors and clean timber boarding
- j) Break out and replace the concrete ground floor and service duct and include damp proof membrane and insulation as necessary
- k) Replace all windows and doors to suit future use of building
- l) Provide insulation to all external and party walls
- m) Re-point external brickwork with a lime based mortar

All work to the property will have to comply with building regulations. Further works to the property may be required as part of the approval process.

## **9.0 Exclusions**

- 9.1 This report comments on the structural condition of the property at the time of inspection only.
- 9.2 The full implications of the requirements of Part M (Disabled Access) of the Building Regulations have NOT been considered.
- 9.3 We have not inspected for mould growth.
- 9.4 We have not exposed or inspected parts of the structure which are covered, unexposed or inaccessible including roofs, floor and sub-floors and we are therefore unable to report that such parts of the structure are free from rot, mould, beetle or other defects.
- 9.5 We did not test building services and thus are unable to report that these are free from defect.
- 9.6 We have not carried out any investigations in respect of asbestos or asbestos related materials and are unable to report that the property is free from this material.

9.7 This report cannot be communicated to a third party or divulged in any way without written permission of the Francis Bradshaw Partnership who are not responsible in any way for conclusions, comment or actions of a third party acting on behalf of this report.

A handwritten signature in blue ink, appearing to read "Peter Calvert". The signature is fluid and cursive, with the first name "Peter" and the last name "Calvert" clearly distinguishable.

.....  
P Calvert BSc, CEng, FIStructE

**APPENDIX “A”**  
**PHOTOGRAPHS**



**Photograph No. 1: Aerial View on Engineering Offices**  
(Note: Engineering Stores Building in the foreground to the left and the roof of the Cottage in the background to the left)



**Photograph No. 2: View on East Elevation of East Building**



**Photograph No. 3: View on North Elevation of East and West Buildings**



**Photograph No. 4: View on West Elevation and Roof of West Building**  
(Note change in brickwork below eaves)  
(Note canteen building roof in the foreground)



**Photograph No. 5: Part View on South Elevation of West Building (Upper level)**  
**(Note change in brickwork above first floor window cill)**



**Photograph No. 6: Part View on South Elevation of West Building**  
**(lower level)**



**Photograph No. 7: Part view on East Elevation of West Building in the background**



**Photograph No. 8: Part View on underside of roof to the East Building**



**Photograph No. 9: View inside Ground Floor Room of West Building  
(Note columns supporting first floor beams)**



**Photograph No. 10: View inside First Floor of West Building  
(Note columns/post and cut outs in face of primary timber floor beam)**



**Photograph No. 11: Part View on First Floor of West Building  
(Note cement based screed and open drain channel)**



**Photograph No. 12: Part View on First Floor of West Building showing screed failure and unfixed base of steel post**



**Photograph No. 13: View inside Second Floor of West Building showing timber framework to Loft**



**Photograph No. 14: Part View of Roof Truss to West Building**



**Photograph No. 15: Part View on Composite Roof Truss to West Building  
(Note gap between apex and underside of ridge)**



**Photograph No. 16: View on Timber Framework to underside of  
Loft in West Building**



**Photograph No. 17: View on Timber Framework supporting Loft in West Building  
(Note metal horizontal tie bar)**



**Photograph No. 18: View on underside of roof slope to West Building  
(Note deflection in purlins)**



**Photograph No. 19: View on roof purlin to West Building showing displaced joint**