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STRUCTURAL APPRAISAL REPORT,

**Coach House and Barns Adjacent to
Austendyke Hall,
Weston Hills,
Spalding,
Lincolnshire**



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Property:-	Coach House & Barns Adj to; Austendyke Hall, Weston Hills, Spalding, Lincolnshire	Instructed:- Dec 2014
Client:-	Mr and Mrs Armson Austendyke Hall, Weston Hills, Spalding, Lincolnshire	Survey & Report by:- J. Ellington BSc. CEng MStructE J. Hicks BEng(Hons) MSc
Reference:-	JC/14/11/2169	Issued:- Jun 2015

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STRUCTURAL APPRAISAL REPORT,

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Our Ref;- JC/14/11/2169

SYNOPSIS

The report provides commentary of observations made during a structural appraisal survey, and identifies the structural defects witnessed within the fabric of the buildings.

The report concludes that the Coach House and Barns are in various stages of condition but each are felt to be suitable for sensitive restoration and conversion into habitable dwellings.

The report recommends and describes various strengthening and remedial details to the roofs, walls floors and foundations that should be conducted as part of any conversion process.

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1.0 BRIEF

- 1.1 JC Consultancy Limited was requested by Mr and Mrs Armson, to assess and comment on the structural condition of an existing Coach House and two existing barns, adjacent to Austendyke Hall, Weston Hills, Lincolnshire.

2.0 INTRODUCTION & SCOPE

- 2.1 The barns are located in a rural location directly off Austendyke Road, Weston Hills.
- 2.2 The client owns the properties and has instructed a structural appraisal report to be carried out in order to assess possible options for future development. This instruction was provided by the client via email correspondence dated 9th December 2014.
- 2.3 This report is solely for the purposes of the client and no other third parties.
- 2.4 JC Consultancy Limited visited the properties on 10th February 2015 and again on 4th June 2015 in order to carry out a structural appraisal survey.
- 2.5 The weather condition at the time of both surveys was dry and bright.
- 2.6 This report is limited to elements of the structural fabric of the properties, i.e roofs, walls and floors, and comments only upon their structural condition and performance.
- 2.7 The report does not contain observations, comments or recommendations to any non structural items including, but not limited to drainage, electrical, heating and plumbing services, timber work and decorative plasters.
- 2.8 Decay associated to damp, fungal attack, insect infestation or contamination is outside the scope of our appointment or report. Any reference to decay associated to damp, fungal attack, insect infestation or contamination to either structural or non-structural items are observations only. As such we recommend that further advice is sought from specialists in the fields of damp, fungal attack, insect infestation or contamination in order to guarantee peace of mind from these potential defects.
- 2.9 The inspection was of a visual nature only. There has been no opening up works involved in this investigation. Wall finishes or floor finishes, including carpets where applicable have not been removed or lifted during the inspection.

- 2.10 Any part of the structures that were hidden, covered or otherwise inaccessible, either by permanent finishes such as, but not limited to wallpaper, decorative plasters, suspended ceilings, or carpets, or by items of furniture, either fitted or freestanding, have not been inspected or commented upon. We therefore cannot guarantee that any such parts are free from defect. It should be noted that the barns and Coach House have been previously used for the housing of agricultural equipment, therefore machinery and other associated items were present. As such some of the internal fabric was hidden, covered or otherwise inaccessible.
- 2.11 The performance of the existing ground strata, general ground conditions and foundations may be referred to within this report; however the ground conditions and foundations have not been inspected as part of this survey. Therefore comments made will be based on analysis sought from indicative desktop sources including but not limited to the 'British Geological Society'. These sources generally provide sound interpretation, however local anomalies can occur, and as such we cannot guarantee their accuracy.
- 2.12 The observations and defects noted within this report should not be read as a comprehensive inventory of each and every single item witnessed during our survey. Instead the records should be taken as an indication of the condition of the barns in general, and should demonstrate the likely defects that may be present elsewhere in areas of the fabric that have not been surveyed or recorded.

3.0 GENERAL DESCRIPTION

- 3.1 The properties consist of a two storey, detached, Coach House, a two storey, detached agricultural barn and a single storey agricultural barn, located on a predominantly level site. The buildings are predominantly surrounded by open fields to the rear and are located directly off Austendyke Road.
- 3.2 The construction date of the buildings are unknown, but it is likely that they were constructed during the late 1800's to early 1900's.
- 3.3 The general construction of the barns consist of;-

3.3.1 Two Storey Coach House

Duo-pitched Roof

A clay pan tile roof covering over a raised collar tied cut roof consisting of timber rafters, collars, purlins and ties.

External Walls

A combination of 330 / 215mm wide, traditional solid wall construction consisting of clay masonry units laid in a lime based mortar mainly in an English Garden Wall style bond, with various masonry piers located throughout.

Internal walls

The internal cross walls are constructed of 215mm wide traditional solid walls consisting of clay masonry units laid in a lime based mortar.

First Floor

Timber floor boards over suspended timber floor joists that span between loadbearing walls.

Ground Floor

The ground floor was not surveyed in detail due to debris and materials present, however it could be seen to be made of a part ground bearing brick/ part flagstone, the specification of which is unknown.

3.3.2 **Two Storey Agricultural Barn**

The two storey barn has been part converted into a Games Room.

Duo-pitched Roof

A clay pan tile roof covering over a timber cut roof, consisting of timber trusses, rafters, collars, purlins and ties.

External Walls

A combination of 330 / 215mm wide, traditional solid wall construction consisting of clay masonry units laid in a lime based mortar mainly in an English Garden Wall style bond, with various masonry piers located throughout. Elevations have been part rendered.

Internal walls

The internal cross wall is constructed of 215mm wide traditional solid wall consisting of clay masonry units laid in a lime based mortar.

First Floor

There is a timber first floor over part of the barn (forming a previously converted Games Room at first floor level) , The floor consists of timber floor boards over suspended timber floor joists that span between loadbearing walls and supporting beams and posts.

Ground Floor

The ground floor was predominately a ground bearing concrete slab system, the specification of which is unknown.

3.3.3 **Single Storey Agricultural Barn**

Duo-pitched Roof

A clay pan tile roof covering over a raised collar tied cut roof consisting of timber rafters, collars, purlins and ties.

External Walls

Predominantly 215mm wide, traditional solid wall construction consisting of clay masonry units laid in a lime based mortar mainly in an English Garden Wall style bond.

Internal walls

The internal cross walls are constructed of 215mm wide traditional solid walls consisting of clay masonry units laid in mortar.

Ground Floor

Earth floors were present throughout.

- 3.4 Published Geological records show the buildings to be within an area where the soil sequence consists of a solid formation of West Walton Formation (Mudstone and Siltstone) overlain by Tidal Flat Deposits (Clays & Silts).
- 3.5 There are no large mature trees in close proximity to the barns, however there are several small trees, shrubs and vegetation growing adjacent to the masonry elevations of the side and rear of the Coach House, and adjacent to the flank and rear gable elevation of the single storey barns.

4.0 OBSERVATIONS AND DEFECTS LOG

(Read in conjunction with Section 2.12 of this report)

4.1 Two Storey Coach House

4.1.1 Roof

- A roof covering is present – there are large areas of missing / slipped tiles.
- The ridge is slightly sagging along its length.
- The roof is displaying signs of minor dishing to both of the roof slopes.
- When viewed internally, the majority of the purlins, rafters and ties are present, but they are reasonably slender when considering their effective span.
- The common rafters and purlins are deflecting between their supports.
- Localised areas of significant water ingress was noted to a number of the timbers.
- Rainwater goods are missing throughout.

4.1.2 Walls

- The masonry elevation walls are generally free from major structural defects. When viewed along their length, the walls appear reasonably plumb.
- A number of high level tie bars have been installed between front and rear elevations.
- Minor displacement of masonry was noted over the 3No arches that form door openings on the front elevation.
- Numerous cracks were noted over the arch to the stairwell doorway.
- Slight distortions to the gable walls were noted, especially at high level (wall thickness reduces to 215mm).
- Timber backing lintels to the majority of the window /door openings have failed.
- A large fracture was noted within the stairwell structure towards the rear of the coach house. The crack is located within an internal corner which forms the junction between the stairwell and the rear elevation of the Coach House.
- Externally, lower levels of masonry adjacent ground level were weathered in parts, presumably from continued wetting and splash back from surface water.

4.1.3 First Floor

- The floorboards are heavily decayed. Numerous floorboards were deemed unsafe to walk over.
- When viewed from ground floor, the majority of the joists are present.
- Joists are reasonably slender. Evidence of localised decay was present.
- Localised areas of water ingress was noted to a number of the timbers.

4.1.4 **Ground Floors**

- The floors have been used for the storage of goods and as such the condition of the floors reflects this.
- From the areas observed there were no signs of significant settlement noted.

4.1.5 **Foundations**

- It is likely that the foundations consist of a shallow corbelled system that is typical of a building of this age and use. The superstructure is not displaying any signs that would suggest the foundation system is under excessive stress. The foundations appear to be performing satisfactorily and as expected.

4.2 **Two Storey Agricultural Barn**

4.2.1 **Roof**

- A roof covering is present – no significant areas of missing / slipped tiles were noted.
- The ridge is slightly sagging along its length, between trusses and cross walls.
- The roof is displaying signs of minor dishing to both of the roof slopes.
- When viewed internally, the majority of the purlins, rafters and ties are present, but they are reasonably slender when considering their effective span.
- The purlins are deflecting between their supports.
- Localised areas of significant water ingress was noted to a number of the timbers.
- The trusses are formed using un-regularised, large section timbers, in the form of Queen post trusses. The trusses are distorted with evidence of charring.
- Rainwater goods are missing throughout.
- Evidence of roof spread can be seen on the walls.

4.2.2 **Walls**

- The masonry elevation walls are generally free from major structural defects.
- A number of tie bars have been installed between front and rear elevations. These are predominantly located at 2/3 height of the elevation. Tying action is provided by conventional bars, straps and chains.
- When viewed along their length, the flank walls are distorted. Distortion, in the form of lateral outward and inward movement generally occurs at the unrestrained areas of elevation, i.e between cross walls and tie bars.

- Numerous vertical cracks were noted above and below windows and at mid length of masonry panels.
- Distortions to the gable walls were observed. Torsional rotation has occurred to the gable wall facing the house.
- Timber backing lintels to the majority of the window /door openings have failed.
- Externally, lower levels of masonry adjacent ground level were weathered in parts, presumably from continued wetting and splash back from surface water.
- A large, former opening has been in-filled in the rear elevation.
- A hard cement render has been applied to the lower section of the elevations.

4.2.3 **First Floor**

- The floorboards could be seen from underside. The majority are in fair condition, with a few localised areas of decay present.
- When viewed from ground floor, the majority of the joists are present.
- Joists do not appear to be overspanned.
- Main timber support beams are deflecting along their length.

4.2.4 **Ground Floors**

- The floors have been used for the storage of goods and as such the condition of the floors reflects this.
- From the areas observed there were no signs of significant settlement noted.
- There were no major fractures within the concrete floor slab.

4.2.5 **Foundations**

- It is likely that the foundations consist of a corbelled system that is typical of a building of this age and use. The superstructure is not displaying any signs that would suggest the foundation system is under excessive stress. The foundations appear to be performing satisfactorily and as expected.

4.3 **Single Storey Agricultural Barn**

4.3.1 **Roof**

- A roof covering is present – there are localised areas of missing / slipped tiles.
- The ridge is sagging along its length between principal supports.
- The roof is displaying signs of significant dishing to both of the roof slopes.
- When viewed internally, the majority of the purlins, rafters and ties are present, but they are slender when considering their effective span.
- A number of split timbers were noted. Distortion and deflection to principal timbers can be seen throughout. Elements are being supported with temporary props.
- The common rafters and purlins are deflecting between their supports.
- Localised areas of significant water ingress was noted to a number of the timbers.
- Evidence of roof spread can be seen throughout.
- Rainwater goods are missing throughout.

4.3.2 **Walls**

- The masonry elevation walls are generally in a poor condition. When viewed along their length, the walls are distorted having laterally pushed out at eaves level.
- The rear facing gable elevation accommodates significant fractures and is partially collapsed at the corner with the flank elevation. Elsewhere various vertical fractures are present.
- A number of tie bars have been installed to flank and gable elevations.
- The internal cross walls are not tied into the flank walls. Tapering vertical cracks are present at the junction of the cross walls and the flank elevations.
- Numerous pockets and voids have been formed into the masonry walls, presumably from previous animal pen / feed equipment.
- Externally, lower levels of masonry adjacent ground level were weathered in parts, presumably from continued wetting and splash back from surface water. Internally, the majority of the walls were damp.

4.3.3 **Ground Floors**

- No solid floors are present. All floors are earth that has been used for livestock.

4.3.4 **Foundations**

- It is likely that the foundations consist of a shallow corbelled system that is typical of a building of this age and use. The superstructure suggests that the foundations are under excessive stress in areas. Rotation appears to have occurred.

5.0 CONCLUSIONS AND RECOMMENDATIONS.

- 5.1 The Coach House has survived well considering its age and previous use and is ideal for sensitive restoration and conversion into a habitable dwelling. The loss of original fabric during conversion is likely to be low.

The Two Storey Barn has survived reasonably well considering its age and previous use. The existing upper storey has already been converted into a Games Room. The barn as a whole has obviously suffered from a degree of movement during its lifetime, and its open plan arrangement does make it vulnerable to further progressive movement in the future. However, with suitable intervention, and by increasing its overall structural robustness, it is viable for restoration and conversion into a habitable dwelling, without losing much in the way of original fabric.

The Single Storey Barn appears to have struggled with ongoing structural issues, and combined with its exposure to decay, is in a generally poor state. Significant repair and structural intervention will be required in order for conversion into a habitable dwelling. The loss of original fabric during conversion is likely to be considerable.

In structural terms many of the defects which have been highlighted within the Observations and Defects Log have little or no significance to the overall robustness of the buildings. The majority of loss of original fabric to date is due to the materials being subjected to the elements. Ensuring the Barns and Coach House are weather-tight should be addressed even if a full conversion or restoration is not going to take place. Failure to do so will accelerate the decay and deterioration of the remaining fabric.

5.2 Two Storey Coach House

- 5.2.1 The buildings basic, rectangular shape, together with the presence of cross walls, and significant wall thicknesses, results in it being a robust structure which can be seen to have only lost a small amount of original fabric during its lifetime.
- 5.2.2 The roof structure of the building is in a reasonable condition but is unlikely to be suitable to be utilised in any conversion without significant strengthening. A replacement roof structure would greatly enhance the overall structural robustness of the building and should be considered.

Existing ties, which essentially tie the top of the walls together, should be retained to prevent further roof spread. if a vaulted / sloping ceiling is required we recommend that the introduction of a ridge beam system, or a feature trussed arrangement utilising King/Queen Post trusses would also prevent additional stresses from being placed upon the walls.

Any decayed timber wall plates should be replaced and should be strapped to the walls in accordance with current building regulations. The existing roof tile finish could be reused and reinstated. A number of replacement tiles will be required to replace missing areas.

- 5.2.3 The walls of the Coach House are predominantly sound and require little attention. Ideally any proposed layout by the architect should retain the cross walls at ground floor level as these are essentially tying the front and rear elevations together. If openings are required through the cross walls, engineered frames should be introduced to ensure that overall stability remains.

The cause of the localised area of cracking and movement is likely to have been contributed by a degree of minor roof spread, together with failure of the masonry arches over the dominant openings. The major fracture within the stairwell is likely to have been contributed by a degree of differential settlement of the stairwell structure. Whilst the cracking does look significant, it does not cause concern.

The performance of the masonry can be improved by low key stitching using the 'Helifix' masonry repair system, which involves installing remedial 'Heli-bar' reinforcing rods into the bed joint of the masonry at regular vertical centres. This creates 'beams' within the brickwork that is ideal for spanning over openings and ensuring the masonry is adequately tied. Furthermore the system can be used over the line of vertical cracks in a 'stitching' process, and can also be utilised in the corner of masonry walls to form 'elbow' restraint ties. More information can be seen at www.helifix.co.uk.

Any areas of hard cement re-pointing previously carried out on the elevations should be carefully removed and replaced with a sympathetic soft lime based mortar. Other small areas of weathered masonry joints should be repointed in a similar fashion. There is not the requirement for all elevations to be repointed, and as such only the localised required areas should be addressed.

Any timber arch backing timbers should be replaced. Any timber wall plates that are present within the thickness of the walls should be removed and replaced with remedial brickwork infill.

Suitable damp-proofing systems should be installed to the walls in accordance with good building practices and the architects requirements.

- 5.2.4 The first floor joists should only require localised strengthening. The introduction of floor straps into the existing walls at regular centres will enhance the integrity of the floor. A chipboard floor deck should be glued and screwed to the joists as this will help to provide diaphragm action to the floor. This could be overlain with existing or reclaimed floor boards for aesthetic purposes.

- 5.2.5 It is assumed that the ground floor will be replaced with a ground bearing, concrete ground floor slab as part of any development. We recommend that the slab should be engineered to ensure that it is suitable to accommodate loadings from the proposed use, including partitions. The slab can also be cut into the existing masonry walls in a 'hit and miss' pocket type arrangement, which once installed, acts as reinforced concrete fingers underneath the walls. This type of installation ensures that the slab will act as a raft type system, which will prevent the existing foundations from accommodating any further movement. This should assist in improving the overall structural performance of the building. Damp proof membranes should be applied underneath the floor slab which should be contiguous with the damp proof course put into the walls.
- 5.2.6 Existing foundations appear to be performing satisfactorily. If the installation of an engineered slab is introduced as discussed in 5.2.5, there should not be the requirement for any strengthening to existing foundations in the form of underpinning as part of the proposed works.
- 5.2.7 Poor performing rainwater discharge gutters and downpipes will result in the continued wetting of masonry and localised areas of timbers. Rainwater goods should be repaired / installed throughout all areas of the building to allow reliable discharge of rain water. The installation of a gravelled apron / French drain type arrangement around the external perimeter walls will assist in relieving the walls and foundations from decay.

5.3 **Two Storey Agricultural Barn**

- 5.3.1 The buildings open plan, double height arrangement and lack of cross walls, has led to its vulnerability to a degree of lateral (outward) movement of walls. This has been exacerbated by forces resulting from roof spread. Attempts have been made reduce movement with the introduction of ties, but this has also inflicted a small amount of dishing to the perimeter walls which is a common defect once ties and pattress plates are installed. Whilst repairs have been made it can be seen that the barn has only lost a small amount of original fabric during its lifetime.
- 5.3.2 The roof structure of the building is in a reasonable condition but is unlikely to be suitable to be utilised in any conversion without significant strengthening. A replacement roof structure would greatly enhance the overall structural robustness of the building and should be considered, however strengthening of principal members is also an option, which if done correctly could provide a similar degree of integrity to a replacement.

The existing feature trusses could be retained in any scheme, however they should be relieved of their principal function of providing vertical support and instead should be relied upon to provide lateral restraint only.

This can be achieved by stiffening the existing rafter and purlin members, and via the introduction of some additional collar ties. Whilst the majority of this strengthening can be done with additional timbers, it is envisaged that a small amount of steel plates will need to be introduced in order to provide 'flitch' action to some of the elements that accommodate high levels of bending.

If the existing roof is being retained and repaired as opposed to replaced, then consideration should also be given to 'plate' the existing roof structure with a plywood diaphragm. This involves installing thin plywood sheeting over the existing rafters. Again, if engineered and constructed correctly, this can greatly increase the overall stability and robustness of the roof structure, and can greatly minimise the forces placed upon the vulnerable flank walls.

Any decayed timber wall plates should be replaced and should be strapped to the walls in accordance with current building regulations. The existing roof tile finish could be reused and reinstated. A number of replacement tiles will be required to replace missing areas.

- 5.3.3 The walls of this barn are predominantly sound but as discussed elsewhere in the report, they have accommodated a reasonable degree of movement in the past.

Ideally any proposed layout by the architect should either introduce cross walls at ground floor level or introduce a first floor structure. Both of these items would significantly increase restraint between the flank walls which would minimise the potential for further lateral movement.

If a double height, two storey arrangement is to remain as part of any scheme, then further tie bars will need to be installed in order to attempt to increase restraint

The introduction of a new inner leaf of blockwork to the perimeter would greatly enhance the structural robustness of the building and we feel it should be considered. If installed, the blockwork can be used to support the new floor and roof structure, in which case the existing masonry walls would essentially become a non-loadbearing cladding system.

Similarly to the Coach House, the performance of the masonry can be improved by low key repairs using the 'Helifix' masonry repair system. (see 5.2.3)

The extent of repointing, and the introduction of damp proofing should be carried out as per the Coach House. (see 5.2.3)

Any timber lintels should be replaced. Any timber wall plates that are present within the thickness of the walls should be removed and replaced with remedial brickwork infill.

- 5.3.4 The first floor joists that support the previously converted Games Room should only require treatment and localised strengthening. The introduction of floor straps into the existing walls at regular centres will enhance the integrity of the floor.

The main support beams do need assistance. This could be achieved with the introduction of a central support post, or if architectural layouts don't allow this, then steel plates could be added to form a 'fitch' type arrangement.

- 5.3.5 It is assumed that the ground floor will be replaced with a ground bearing, concrete ground floor slab as part of any development. We recommend that the slab should be engineered to ensure that it is suitable to accommodate loadings from the proposed use, including the earlier recommended blockwork inner leaf and partitions. Once installed, the slab will act as a raft type slab system, which will minimise any additional loadings placed upon the existing foundations. This should assist in improving the overall structural performance of the building. Damp proof membranes should be applied underneath the floor slab which should be contiguous with the damp proof course put into the walls.

- 5.3.6 Existing foundations appear to be performing satisfactorily. If the installation of an engineered slab is introduced as discussed in 5.3.5, there should not be the requirement for any strengthening to existing foundations as part of the proposed works.

- 5.3.7 Rainwater guttering replacement and the installation of a gravelled apron should be carried out as per the Coach House. (see 5.2.7)

5.4 Single Storey Agricultural Barn

- 5.4.1 The Single Storey Barn has struggled with ongoing structural issues, and combined with its exposure to decay, is in a generally poor state.

- 5.4.2 The roof structure of the barn is in a very poor condition and has partially collapsed in areas. We do anticipate that a replacement roof will be required throughout. The roof should be engineer designed in such a way that thrust is not placed upon the supporting walls in order to reduce its susceptibility to future stress.

We envisage that the remaining roof covering can be carefully removed, stored and reinstated after the installation of the new roof structure.

- 5.4.3 The walls of the barn will require significant attention in order for them to perform satisfactorily. Due to the extent of deterioration to the masonry, we do feel that the introduction of a new inner leaf of blockwork to the perimeter walls is required. The blockwork can be used to support the new roof structure to enable the existing masonry walls to essentially become a non-loadbearing cladding system. Using remedial wall ties, the existing masonry walls can be tied to the new blockwork in order to reduce any further bulging and lean that may occur under its own self weight.

Once the new structural inner leaf blockwork has been installed as above, the remainder of the existing walls can be repaired in order to provide protection from the elements only. This will involve low key repointing and crack stitching using the Helifix system as described elsewhere in this report.

The existing cross walls are doing little in the way of providing adequate restraint, and can be replaced with new partitions at locations to suit the proposed layout.

Lintels and arch backing timbers should be replaced throughout.

- 5.4.4 Similarly to the other barn and coach house, the ground floor will need to be replaced with a ground bearing, reinforced concrete ground floor slab that is suitable to accommodate loadings from the proposed use, including the recommended blockwork inner leaf, and any partitions.

The floor should also incorporate insulation and damp proof systems as specified by the architect to meet current regulations. The floor slab should be engineer designed to take into account the ground conditions, as this area has never accommodated surcharge loading from an existing slab.

- 5.4.5 Whilst existing foundations may have formerly struggled, the installation of the engineered slab should eliminate the need for any strengthening to existing foundations in the form of traditional underpin.

- 5.5 Whilst references to damp may have been mentioned in this report, it should be noted that any recommendations for repair and control of damp and decay is outside the scope of this report (see 2.8). It is clear that all the structures have suffered from a degree of water penetration over the years. This will have been encouraged by both the exposure to the elements, and previous use by livestock. In addition, due to the large quantities of timbers within the barns, the likely hood of insect / beetle attack on the timbers is high.

Therefore it is essential that further surveys and advice from specialists in the field of damp and timber decay should be carried out prior to commencement of works in order to ensure that damp and timber decay are not trapped within the fabric following conversion. Any repairs recommended by the third party reports should be carried out accordingly.

- 5.6 We recommend that all repair details and designs are produced and submitted by a suitable Architect and Engineer who appreciate the sensitive nature of the existing barns. In addition we recommend that all works are carried out by contractors who have experience dealing with repairs to properties of this nature.

JC Consultancy Limited

Consulting Structural & Civil Engineers

Jun 2015

6.0 PHOTOGRAPHS – COACH HOUSE



Photograph # 1



Photograph # 2



Photograph # 3



Photograph # 4



Photograph # 5



Photograph # 6



Photograph # 7



Photograph # 8



Photograph # 9



Photograph # 10



Photograph # 11



Photograph # 12



Photograph # 13



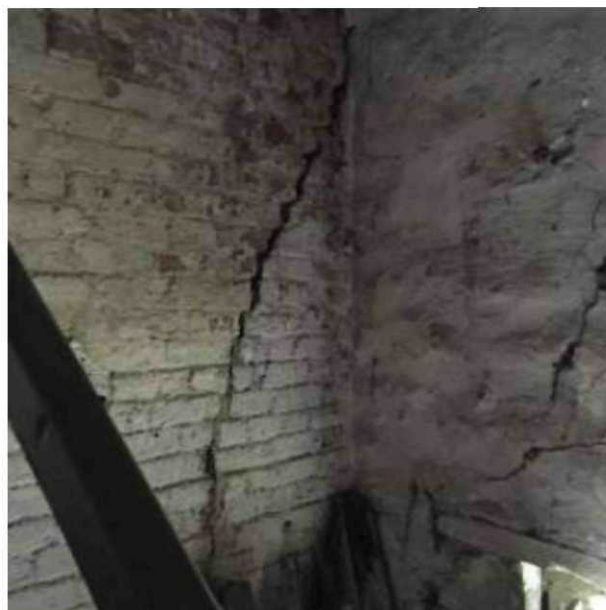
Photograph # 14



Photograph # 15



Photograph # 16



Photograph # 17



Photograph # 18



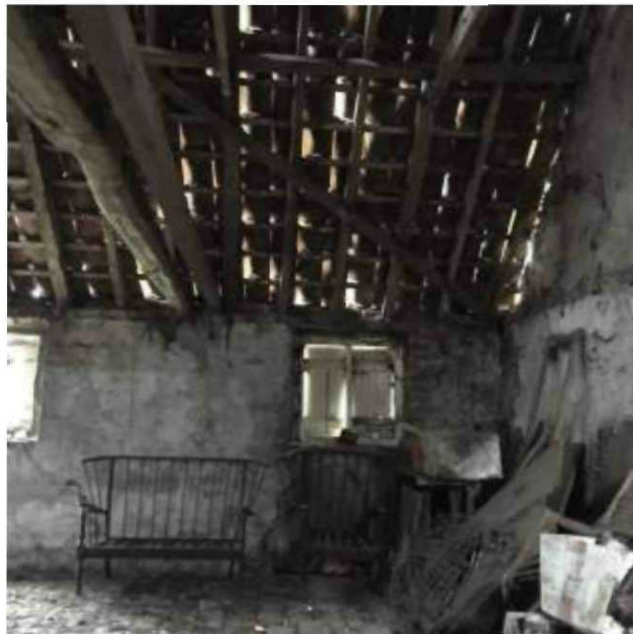
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Photograph # 20



Photograph # 21



Photograph # 22



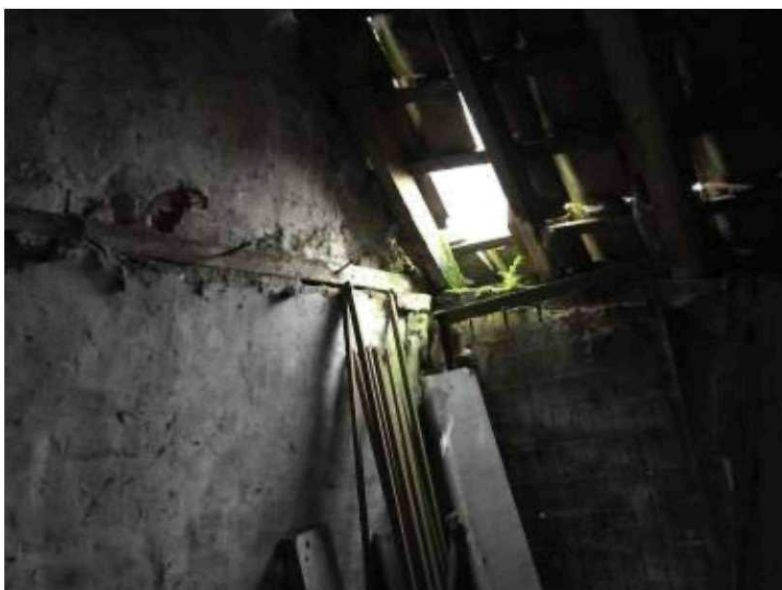
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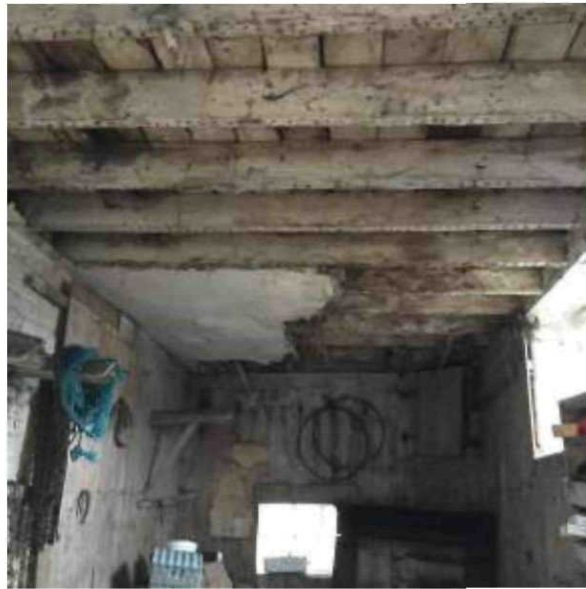
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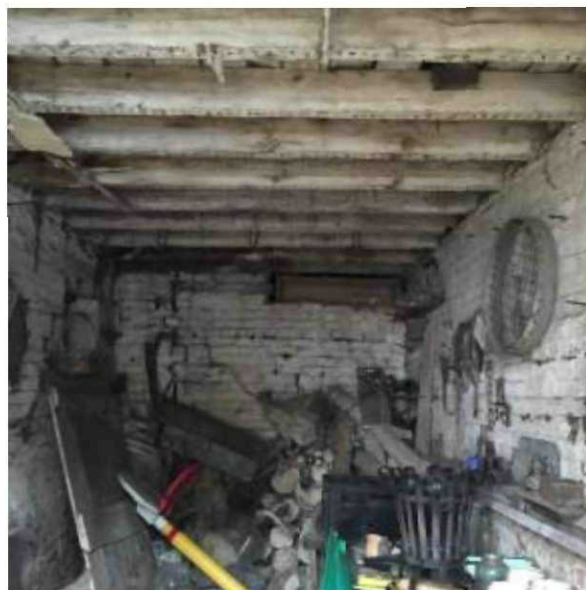
Photograph # 25



Photograph # 26



Photograph # 27



Photograph # 28



Photograph # 29

PHOTOGRAPHS – TWO STOREY AGRICULTURAL BARN



Photograph # 30



Photograph # 31



Photograph # 32



Photograph # 33



Photograph # 34



Photograph # 35



Photograph # 36



Photograph # 37



Photograph # 38



Photograph # 39



Photograph # 40



Photograph # 41



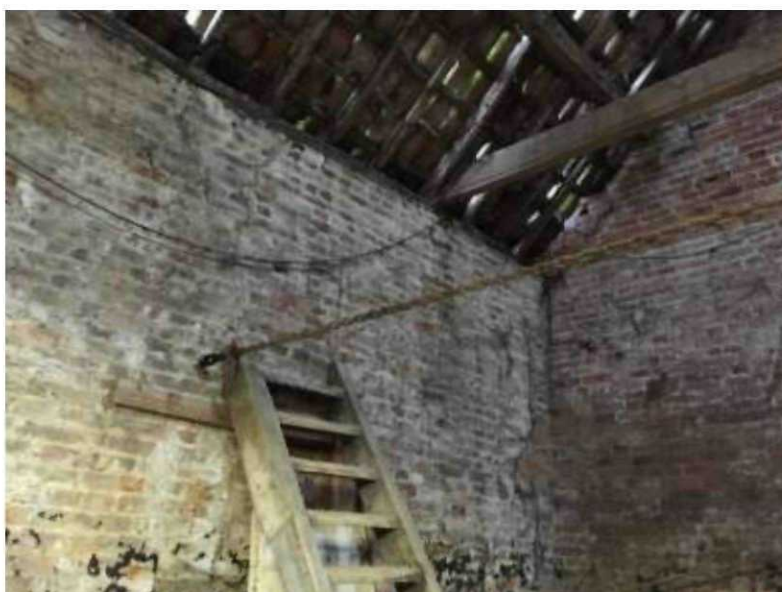
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Photograph # 43



Photograph # 44



Photograph # 45



Photograph # 47



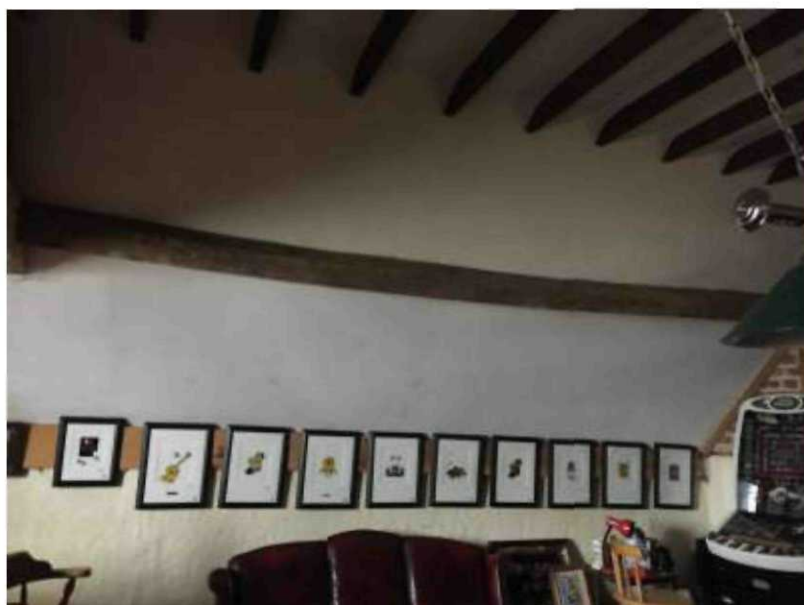
Photograph # 48



Photograph # 49



Photograph # 50



Photograph # 51



Photograph # 52



Photograph # 53



Photograph # 54



Photograph # 55

PHOTOGRAPHS – SINGLE STOREY AGRICULTURAL BARN



Photograph # 56



Photograph # 57



Photograph # 58



Photograph # 59



Photograph # 60



Photograph # 61



Photograph # 62



Photograph # 63



Photograph # 64



Photograph # 65



Photograph # 66



Photograph # 67



Photograph # 68



Photograph # 69



Photograph # 70



Photograph # 71



Photograph # 72



Photograph # 73

END OF REPORT