

Project Name: Stakers Farm Barns, Yapton, BN10 0PU

QED Ref: 19-211

Document Ref: 19-211

Date of Issue: 26 July 2019

Date of Site Visit: 27 June 2019

Prepared by: Ian Waddingham

Approved by Ian Waddingham

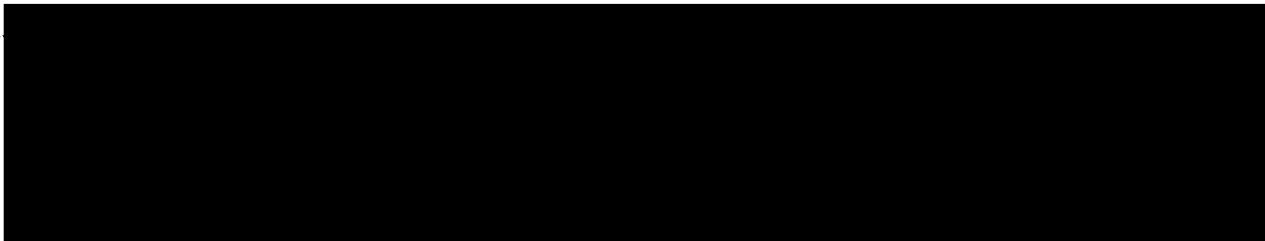
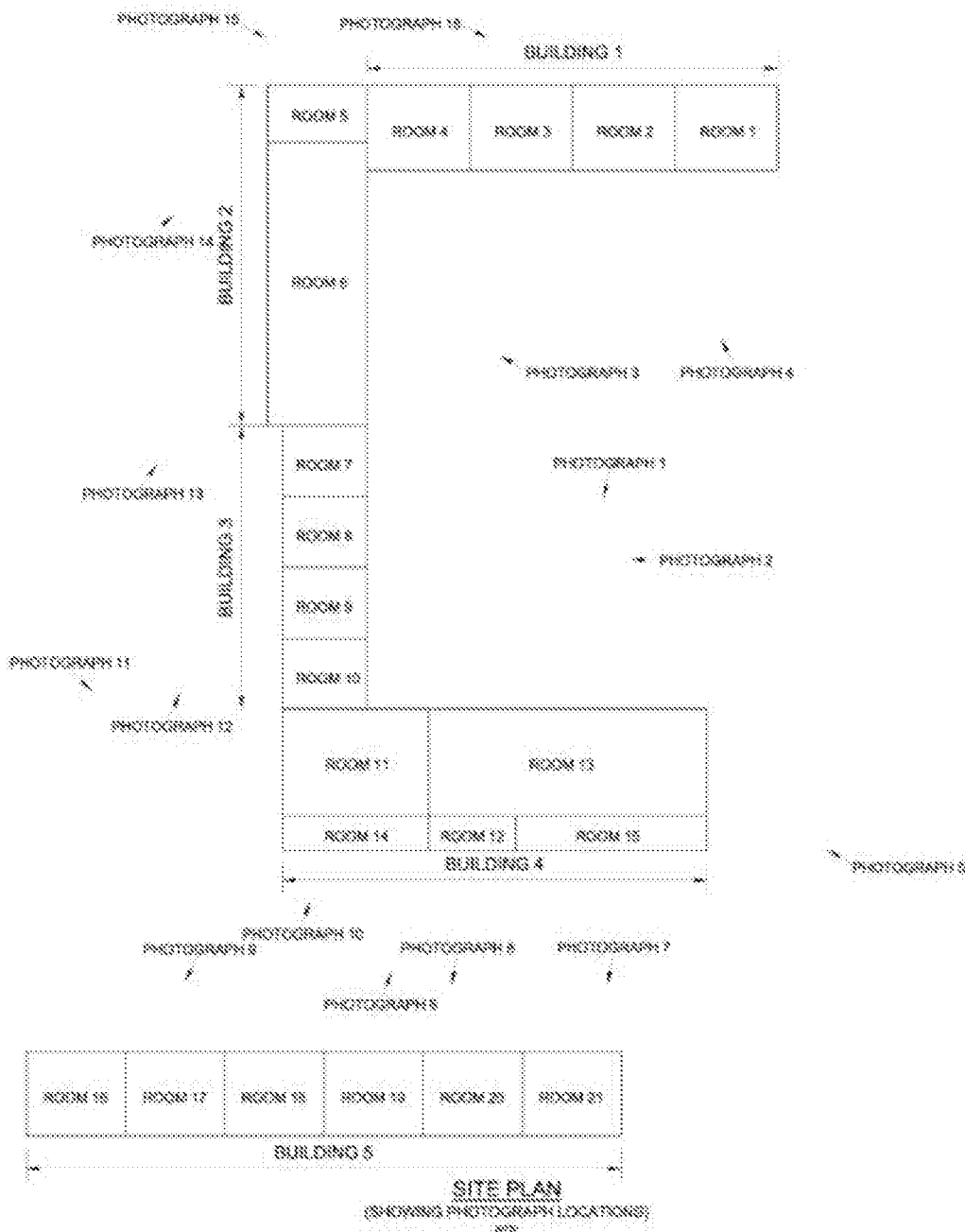
1. INTRODUCTION

QED Structures visited the above site on 27th June 2019 to carry out a visual walkover survey to be able to provide a structural assessment of the existing barns structures and identify any potential structural concerns with regards to converting the buildings into habitable buildings.

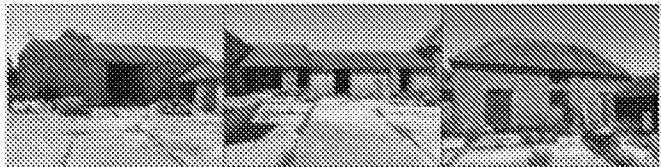
There were a total of 5 different barns that were inspected, please see the plan on the following page showing the layout, together with the location of a series of external photographs that were taken of the external elevations of the 5 buildings, these photographs can be seen on page 3 of this report.

The following report provides an overall view based on the site observations of both the external elevations and internal areas within each building separately.

1. INTRODUCTION



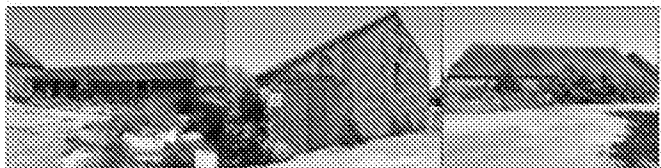
1. INTRODUCTION



PHOTOGRAPH 1

PHOTOGRAPH 2

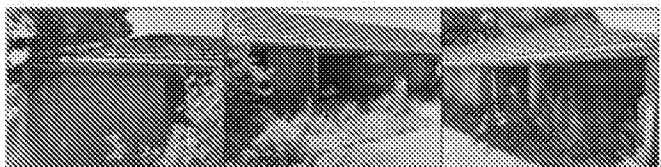
PHOTOGRAPH 3



PHOTOGRAPH 4

PHOTOGRAPH 5

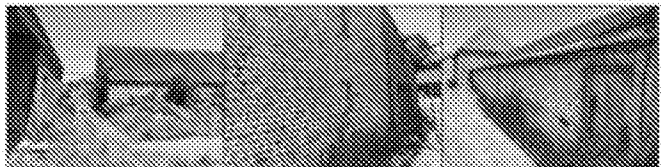
PHOTOGRAPH 6



PHOTOGRAPH 7

PHOTOGRAPH 8

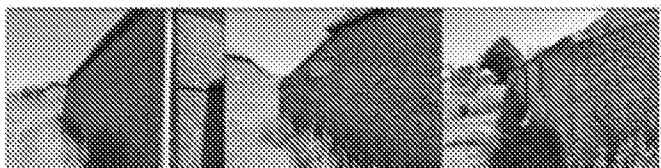
PHOTOGRAPH 9



PHOTOGRAPH 10

PHOTOGRAPH 11

PHOTOGRAPH 12



PHOTOGRAPH 13

PHOTOGRAPH 14

PHOTOGRAPH 15



PHOTOGRAPH 16

2. EXTERNAL OBSERVATIONS

BUILDING 1

Front Elevation - It appears the existing building originally had an open front elevation with 4 number posts providing open areas for animals to be able to enter the building for feeding. The front elevation has since been altered and a series of low level flint/brick walls built together with some timber cladding to form 4 number separate rooms.

The roof has clay tiles with clay ridge tiles on a series of timber trusses and rafters. The ridge itself is very uneven which suggests there has been a certain amount of movement in the roof historically. There is a gutter at the eaves of the roof at the front which is partially missing.

The infill walls simply butt up against the cylindrical post bases.

Rear Elevation - The rear elevation is formed from solid flint/brickwork with no openings. There is no eaves gutter along the rear elevation.

Please see below a series of photographs of the external photographs for building 1.



Building 1 – Front elevation

2. EXTERNAL OBSERVATIONS



Building 1 – front elevation showing uneven ridge and infill external walls



Building 1 – Front elevation showing uneven ridge and infill external walls

2. EXTERNAL OBSERVATIONS



Building 1 – Rear elevation

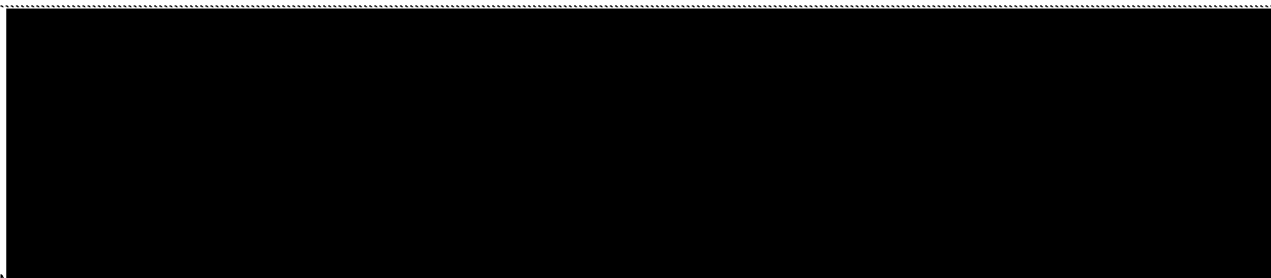
BUILDING 2

Front Elevation - The front elevation is formed from brickwork with 2 number doors and 2 number windows within the elevation. The mortar joints in the brickwork were in poor condition with large areas or repointing required. There was cracking through the lintel above one of the doors and historic diagonal cracking above the other door which has been repointed.

The roof has clay tiles with clay ridge tiles on a series of timber trusses and rafters. There is a gutter at the eaves of the roof at the front and returning down the sides of the building.

Rear Elevation –The rear elevation was solid brickwork with no openings. There was some vertical cracking on the side wall at high level which abuts Building 3. There is an eaves gutter and downpipe at one corner of the rear elevation.

Please see below a series of photographs of the external photographs for building 2.



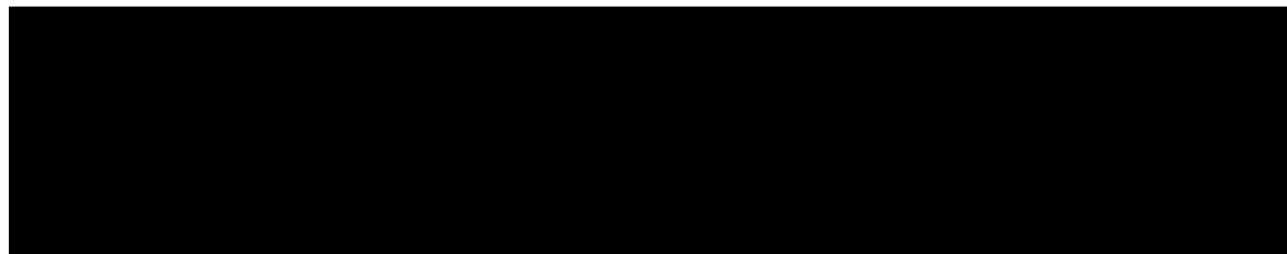
2. EXTERNAL OBSERVATIONS



Building 2 – Front elevation



Building 2 – front elevation showing diagonal cracking above one of the doors, which has been repointed



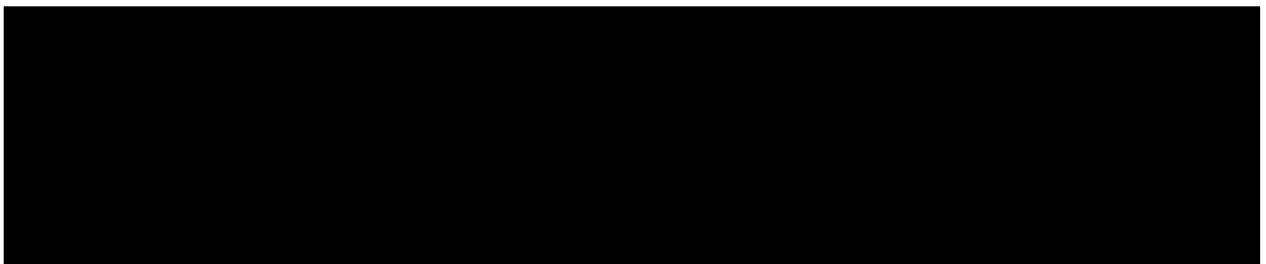
2 EXTERNAL OBSERVATIONS



Building 2 – Front elevation showing vertical crack through the lintel above one of the doors



Building 2 – Side elevation showing vertical cracking in side wall abutting Building 3



2. EXTERNAL OBSERVATIONS



Building 2 - Rear elevation

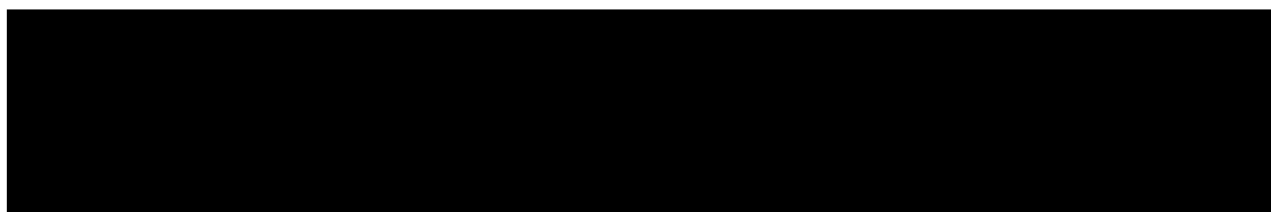
BUILDING 3

Front Elevation - The front elevation is formed from brickwork and flint with 4 number openings into the building, there was no visible signs of cracking to the front elevation wall, however there were gaps between the timber wall plate and wall with one loose brick next to one of the doors. The timber lintel across the larger opening was clearly deflecting at mid-span.

The roof has clay tiles with clay ridge tiles on a series of timber trusses and rafters. There is a gutter at the eaves of the roof at the front.

Rear Elevation –The rear elevation was brickwork and flint with one opening adjacent to Building 4. There is eaves guttering along the entire length with one number downpipe in the center of the building.

Please see below a series of photographs of the external photographs for building 3.



2. EXTERNAL OBSERVATIONS



Building 3 - Front elevation



Building 3 - Rear elevation

2. EXTERNAL OBSERVATIONS

BUILDING 4

Front Elevation - The front elevation is formed from brickwork and flint with 1 number large full height opening into the building. There were also 6 number small vertical slot windows in the elevation. There is a timber frame around the large opening, the base of the two columns were rotten and the beam at eaves level was sagging in the center. There was vertical cracking between the flint and brickwork at the corner of the building at the junction where you enter the courtyard.

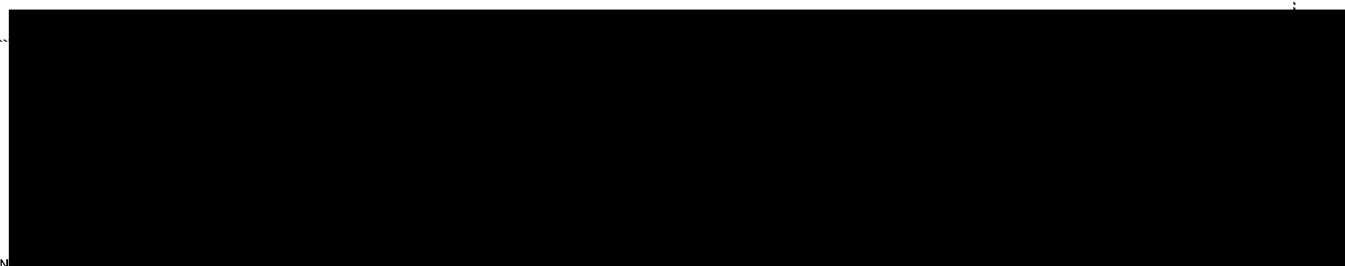
The roof has clay tiles with clay ridge tiles on a series of timber trusses and rafters. There is a gutter at the eaves of the roof at the front with two downpipes, one each side of the door opening. The ridge is slightly uneven along its full length.

Side Elevation – The side elevation as you enter the courtyard has vertical cracking between the flint and brickwork at the corner of the building.

Rear Elevation – The rear elevation is covered with vegetation so is difficult to see the condition of the wall. There is a gutter at the eaves of the roof at the rear of the building.

Side Elevation – The side elevation as you walk around the back of the buildings to the rear of building 3 had vertical cracking between the flint and brickwork at the corner of the building.

Please see below a series of photographs of the external photographs for building 4.



2. EXTERNAL OBSERVATIONS



Building 4 - Front elevation



Building 4 – Rotten base of post to door opening

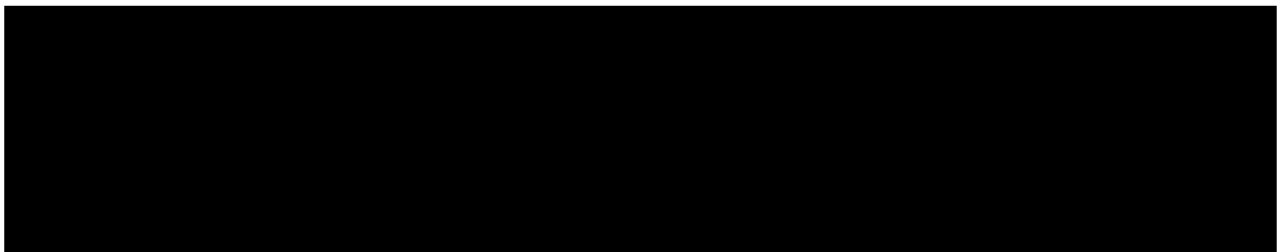
2. EXTERNAL OBSERVATIONS



Building 4 – Sagging timber beam at eaves level of door opening



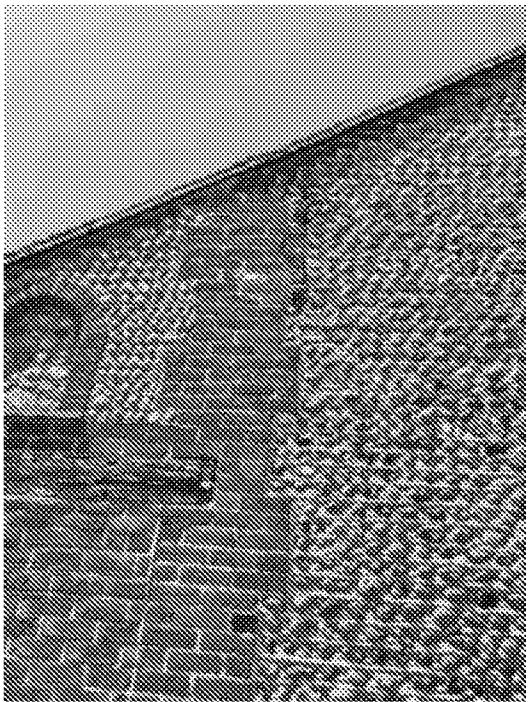
Building 4 – Cracking between flint and brickwork on corner



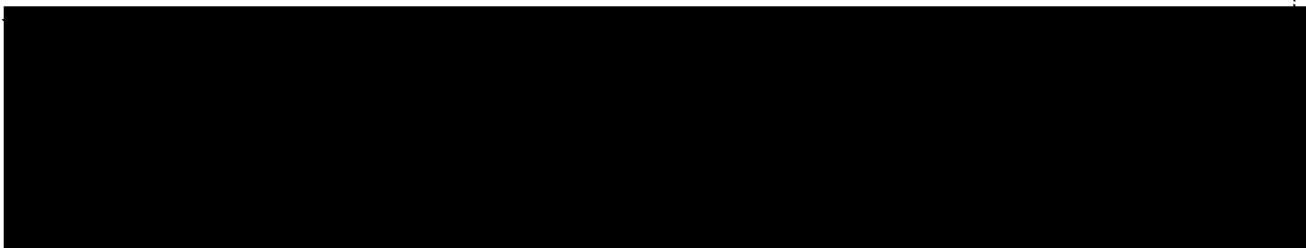
2. EXTERNAL OBSERVATIONS



Building 4 – Side elevation as you enter the courtyard



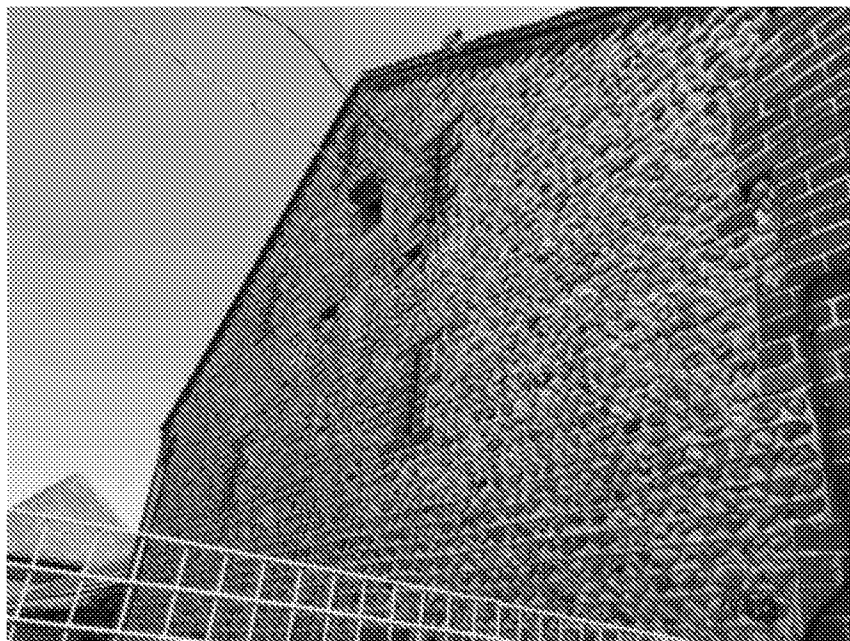
Building 4 – Cracking between flint and brickwork



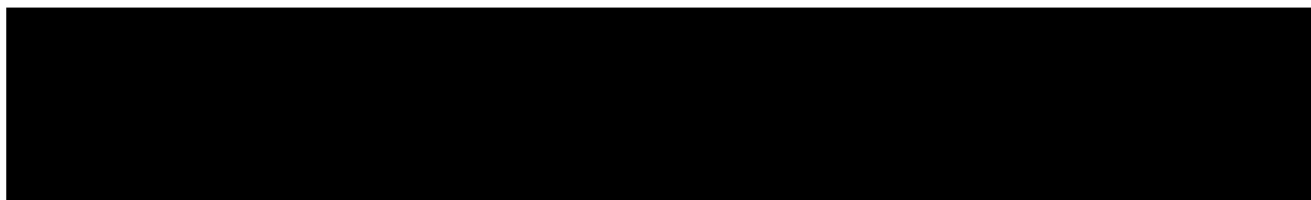
2. EXTERNAL OBSERVATIONS



Building 4 – Rear elevation covered in vegetation



Building 4 – Side elevation to rear of building 3



2 EXTERNAL OBSERVATIONS



Building 4 – Side elevation to rear of building 3 showing cracking between flint and brickwork

BUILDING 5

Building 5 is a stand-alone building away for the other 4 buildings that form the courtyard.

Front Elevation - The front elevation is formed from a series of timber cladding panels with a section of brickwork and flint at one end with 1 number large full height opening into the building at the other end. There was vertical cracking between the flint and brickwork at the corner of the building.

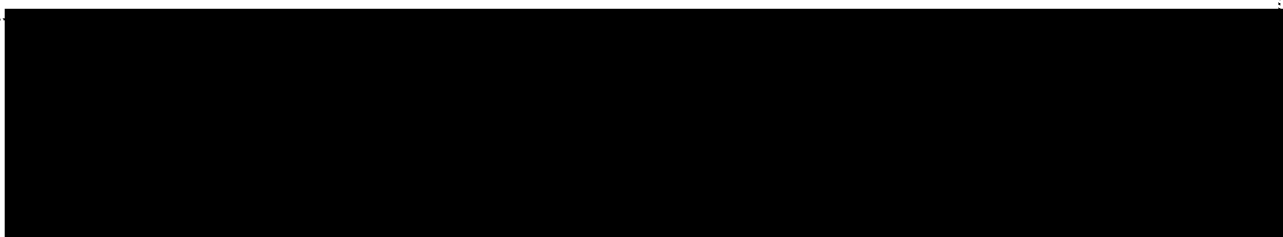
The roof has concrete tiles with concrete ridge tiles on a series of timber trusses and rafters. There is a gutter at the eaves of the roof at the front. The ridge was slightly uneven along its full length.

Vegetation was covering some areas of the front elevation.

Side Elevations – It was not possible to closely inspect the side elevations due to an adjacent structure close to the building at one end and the site boundary with overgrown vegetation at the other end.

Rear Elevation – The rear elevation was covered with vegetation so was difficult to see the condition of the wall.

Please see below a series of photographs of the external photographs for building 5.



2 EXTERNAL OBSERVATIONS



Building 5 – Front elevation showing the open bay end of the elevation



Building 5 – Front elevation showing timber clad sections of the elevation

2 EXTERNAL OBSERVATIONS



Building 5 – Front elevation showing the flint/brickwork end of the elevation and vertical crack



Building 5 – Rear elevation showing vegetation

4 INTERNAL OBSERVATIONS

BUILDING 1

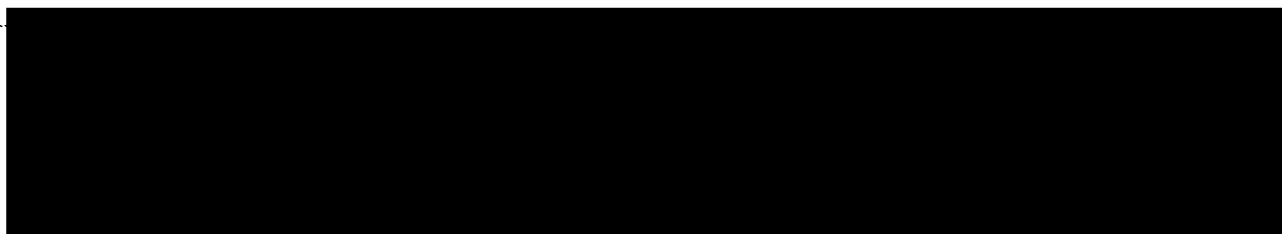
The internal space for building 1 is split into 4 number individual rooms. Each room is divided from each other with either a blockwork or timber wall.

The roof for the building is formed from a series of timber trusses with timber purlins and rafters between. There is evidence of roof spread at the rear wall as the rear wall is clearly leaning outwards. There is also varying degrees of cracking between the rear wall and internal room division walls, which substantiates the suggestion that there has been lateral movement at eaves level. The most significant areas of lateral movement appeared in the areas where there were only a limited number of collars/ties between rafters. In rooms where there were roof trusses present, the lateral movement was less. There are also locations where the truss bearing onto the wall was reduced to approx. 30mm on the rear wall, due to the spreading at eaves level. There is evidence of decaying timbers in areas due to the fact that the rooms are exposed to the elements.

Please see below a series of photographs of the internal photographs for building 1.



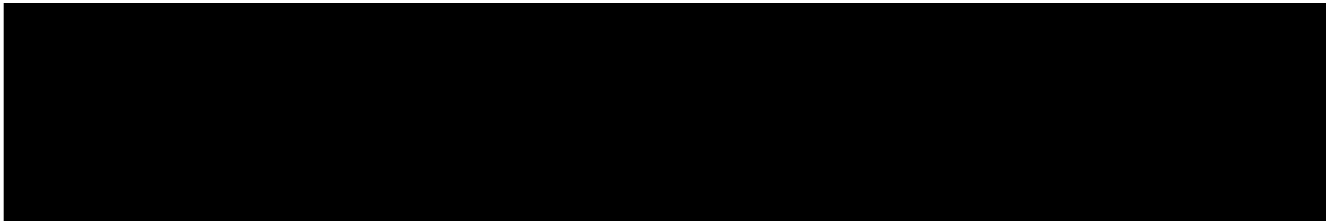
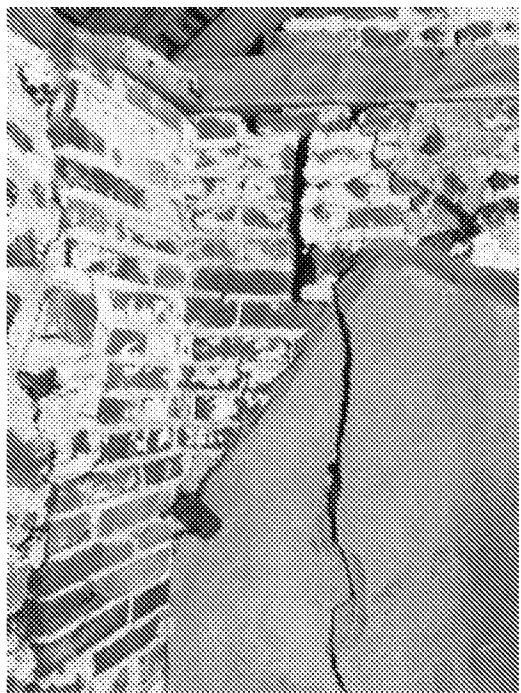
Building 1 – Low level flint and brickwork wall with timber clad above



4 INTERNAL OBSERVATIONS



Building 1 – Roof rafters with purlins and one number collar/ties for lateral restraint

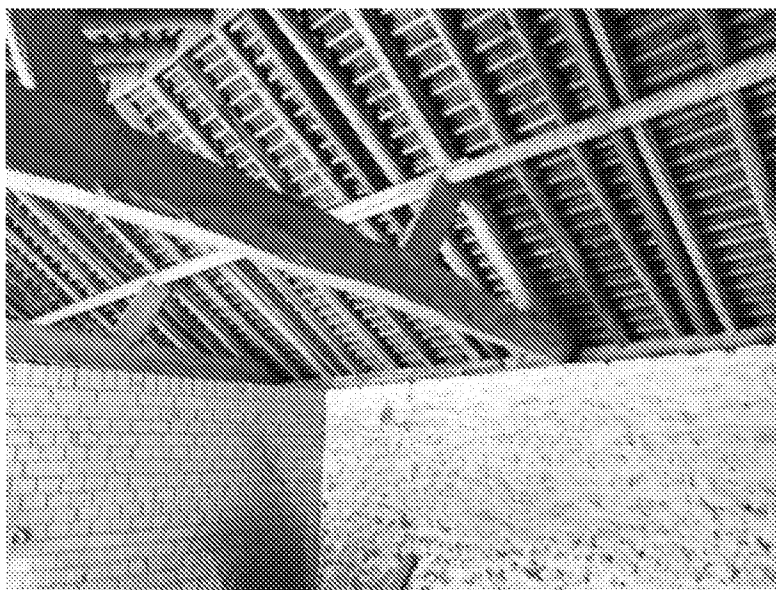


4 INTERNAL OBSERVATIONS

Building 1 – Typical vertical cracking in return wall at junction of rear wall where there has been roof spread



Building 1 – Typical vertical cracking in return wall at junction of rear wall where there has been roof spread



4 INTERNAL OBSERVATIONS

Building 1 – Typical roof truss

BUILDING 2

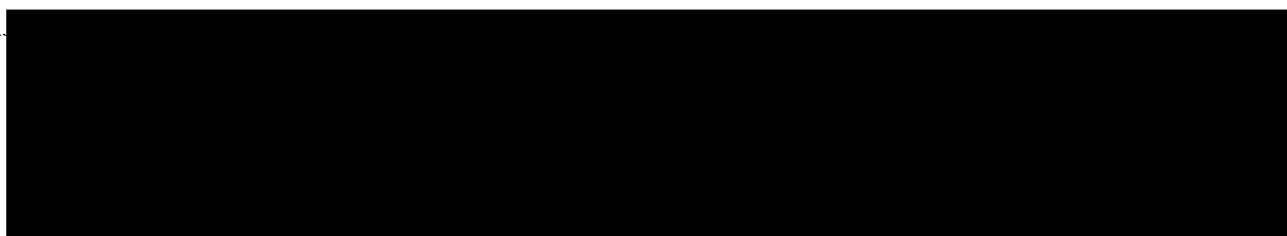
The internal space for building 2 is split into 2 number individual rooms a small single storey room at the end of the building abutting building 1 and a two storey section for the main part of the building as can be seen from the front elevation photograph. The roof to the single storey section is mono pitched with the ridge of the roof supported on the wall to the main two storey building. There are a few areas of minor diagonal and vertical cracking in the wall. The main building has a series of timber beams spanning front to back forming the main structural support for the floor with timber joists spanning between these beams. There are 4 separate spaces to this room with divisions formed from timber, with some of the bases of the timber posts being rotten. These are secondary timbers only for dividing the space and not supporting the floor above. There are timber lintels at ground floor level over the external doors and areas of loose/missing brickwork in the external wall at low level. There is some vertical cracking at the junction of building 2 and building 3.

The first roof consisted of a series of timber roof trusses, purlins and rafters.

Please see below a series of photographs of the internal photographs for building 2.



Building 2 – Single storey area with mono-pitched roof, showing diagonal cracking above doorway



4 INTERNAL OBSERVATIONS

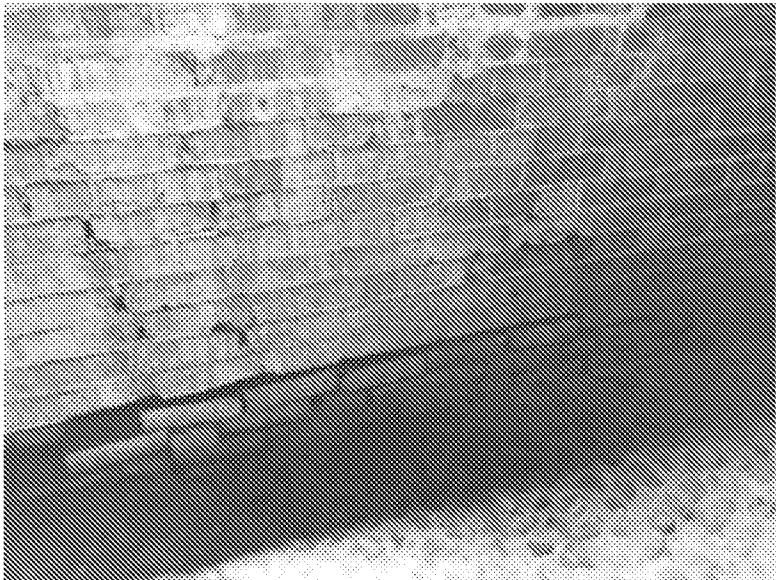


Building 2 – Timber beams and floor joists for first floor and timber divisions at ground floor level

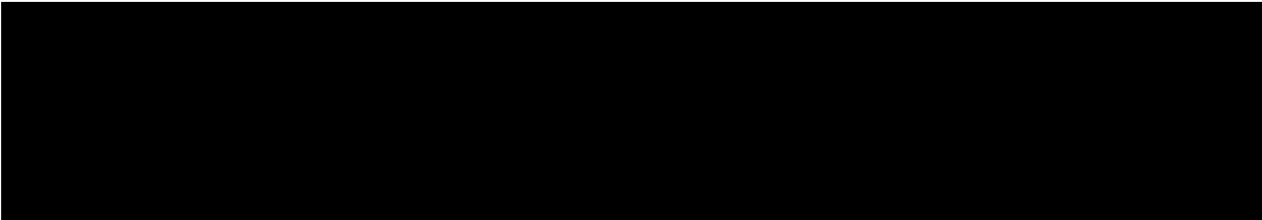


Building 2 - Timber beams and floor joists for first floor and timber padstones in the wall

4. INTERNAL OBSERVATIONS



Building 2 – Loose/missing brickwork at low level



4. INTERNAL OBSERVATIONS

Building 2 – Vertical crack in end wall next to Building 3 which extends through the full thickness of wall



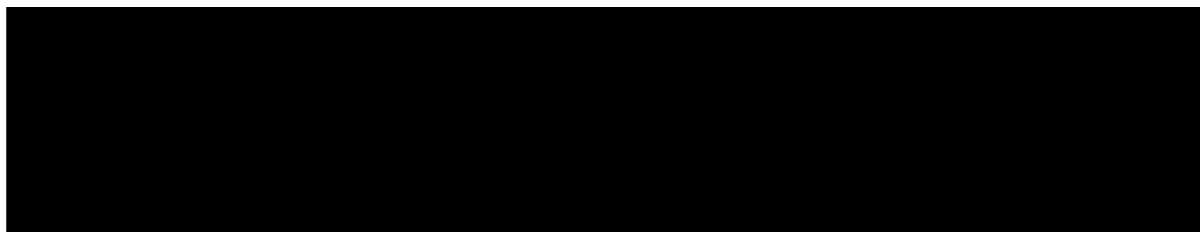
Building 2 – Timber roof trusses

BUILDING 3

The internal space for building 1 is split into 4 number individual rooms. Each room is divided from each other with either a blockwork or brickwork wall.

The roof for the building is formed from a series of timber trusses formed of rafters, ties, collars and timber purlins. There is evidence of roof spread at the rear wall. There is also varying degrees of cracking between the rear wall and internal room division walls, which substantiates the lateral movement at eaves level.

Please see below a series of photographs of the internal photographs for building 3.



058035
s.co.uk
s.co.uk
s.co.uk
s.co.uk
limited.
03 2DF
MICE

4 INTERNAL OBSERVATIONS



Building 3 – Timber roof trusses formed from rafters, ties, collars and purlins



Building 3 – Timber roof trusses formed from rafters, ties, collars and purlins and room division wall

4 INTERNAL OBSERVATIONS



Building 3 – Cracking at internal return wall and rear wall

BUILDING 4

The internal space for building 1 is split into 5 number individual rooms. Each room is divided from each other with either a brickwork or timber wall.

Room 11 – This room has an additional floor added at first floor level, there is a steel beam splitting the span of the timber floor joists, the steel beam is slightly corroded. The steel beam is then supported on masonry piers each end. All walls at ground floor level are boarded or finished therefore it was not possible to see the condition of the brickwork/flint walls. At first floor level the walls are also boarded or finished with some of the timber trusses exposed. The areas of timber truss visible appeared to be in good condition.

4 INTERNAL OBSERVATIONS

Rooms 12, 13, 14 – These rooms are at the back of the main building. Generally the rooms are boarded out and it was not possible to see the condition of the walls. There are a number of cracks in the walls between brickwork and flint sections of wall. The ground floors are concrete.

Room 13 – This is the main space to the building with 4 main trusses within the space spanning front to back with purlins and rafters. There is general vertical cracking between the flint and brickwork wall section. The ground floor is concrete.

The roof for the building is formed from a series of timber trusses formed of rafters, ties, collars and timber purlins. There is evidence of roof spread at the rear wall. There is also varying degrees of cracking between the rear wall and internal room division walls, which substantiates the suggestion that there has been lateral movement at eaves level.

Please see below a series of photographs of the internal photographs for building 4.



Building 4 – Main space with timber trusses showing steps to first floor level

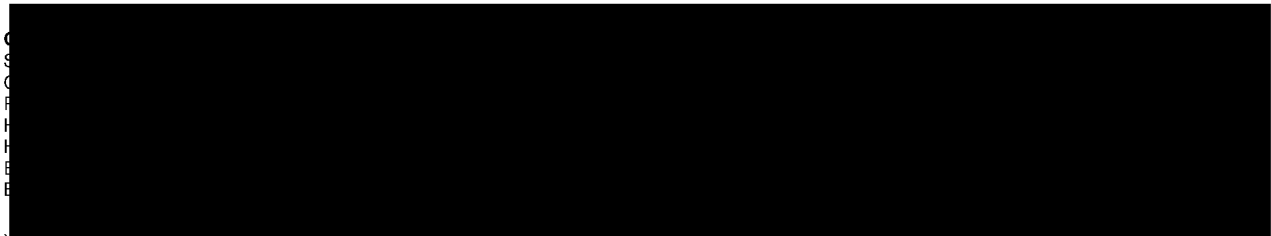
4. INTERNAL OBSERVATIONS



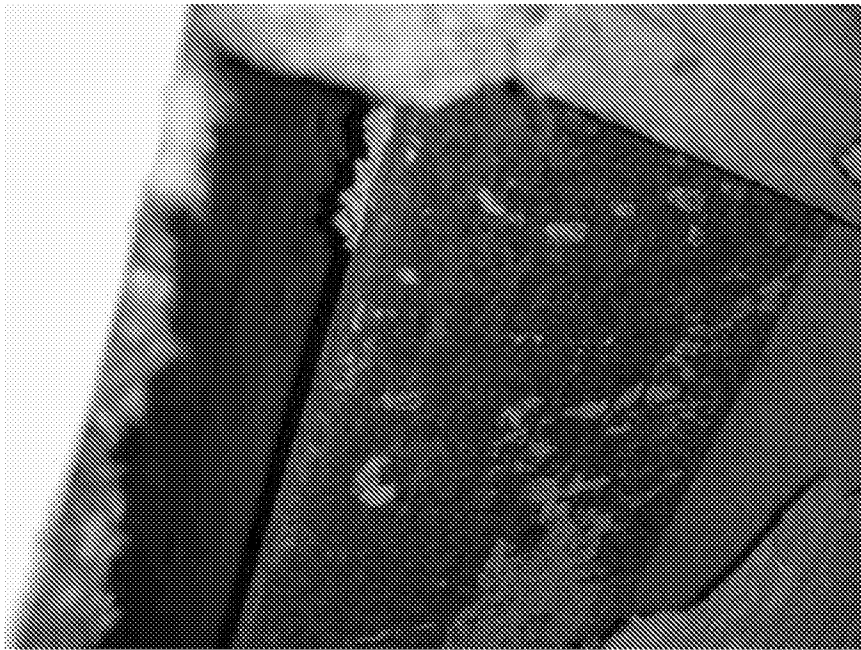
Building 4 – Trusses partially exposed at first floor level



Building 4 – Boxed in steel beam supporting first floor joists



4 INTERNAL OBSERVATIONS



Building 4 – Corroded steel beam supporting first floor joists



Building 4 – Typical vertical cracking between brickwork and flint

4 INTERNAL OBSERVATIONS



Building 4 – General view of high external walls



Building 4 – General view of high external walls

4 INTERNAL OBSERVATIONS

BUILDING 5

The internal space for building 1 is split into 6 number individual rooms. Each room is divided from each other with either a brickwork or timber wall.

Most rooms are boarded out and it is not possible to see the condition of the walls. There are a number of rooms where the timber trusses are partially visible.

Room16 – the structure is visible, which consisted of timber roof trusses, purlins and rafters. Also the walls are visible and formed of brickwork and flint. The base of the timber post forming the support for the roof truss is rotten at its base.

Room 17 - the structure is visible, which consisted of timber roof trusses, purlins and rafters. Also the walls are visible and formed of brickwork and flint.

Please see below a series of photographs of the internal photographs for building 5.

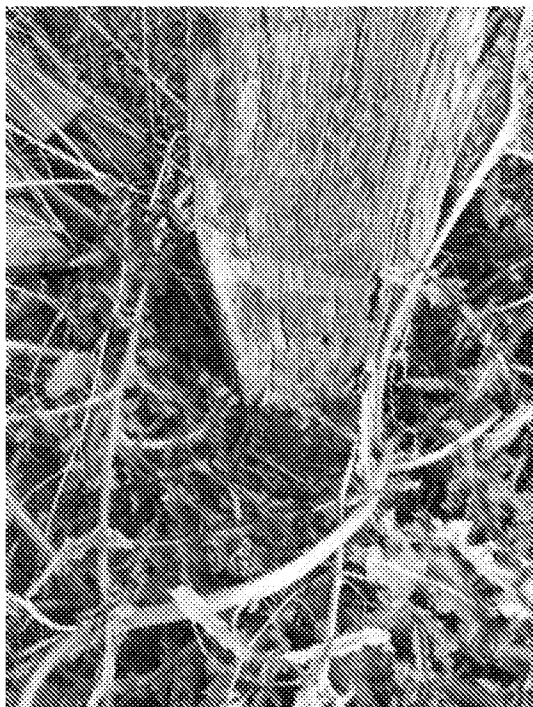


Building 5 – Roof trusses visible in room 16

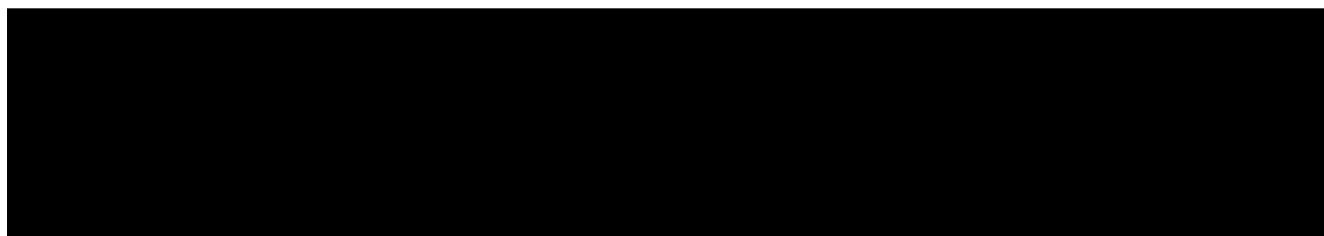
4 INTERNAL OBSERVATIONS



Building 5 – Room 16 exposed walls



Building 5 – Rotten base of post to room 16 on top of concrete plinth, supporting roof truss



4 INTERNAL OBSERVATIONS



Building 5 – Room 17 showing roof and walls



Building 5 – Good condition base of post to room 17 on top of concrete plinth

4 INTERNAL OBSERVATIONS



Building 5 – Boarded out room with bottom chord of truss visible



Building 5 – Timber clad room, structure not visible

4. INTERNAL OBSERVATIONS



Building 5 – Wall not visible, elements of the timber roof visible only



Building 5 – Full roof not visible only a purlins and wall plates

4 CONCLUSION AND RECOMMENDATIONS

Based on the visual inspection only of the existing 5 barns, please find below our conclusion and recommendations for each barn with regards to the structural integrity and what we believe would be required to each barn to allow them to be renovated into habitable buildings:-

Building 1

Front Wall – The front brickwork/flint walls with timber cladding above would need to be demolished and rebuilt, as they are not in very good condition and it is assumed there are no or minimal foundations supporting these walls. The posts supporting the main timber trusses are to be underpinned to be able to provide a good firm foundation. The new wall would need to be built off a new foundation that would be constructed between the underpin sections for the posts. The new walls would then provide a good solid support for the roof with new Catnic or similar lintels as required for any new windows or doors. The depths of the existing foundation and proposed underpinning or new foundations are all subject to the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Rear Wall – The rear wall has been pushed outwards by the spread of the roof, therefore it is recommended this wall be underpinned along its full length to provide a good firm foundation. Any new openings within this wall would need to be supported with Catnic or similar lintels. The rear wall is to be fixed back to the internal and side walls running perpendicular to the rear wall with Helifix ties or similar to provide a lateral restraint at each junction. Where possible it would also be prudent to carry out some local stitch repairs between walls. The depths of the existing foundation and proposed underpinning or new foundations are all subject to the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Internal/Side Walls – All original internal and side walls that are to be retained are to be underpinned to provide a good solid foundation to each wall. These walls are to be fixed back to the rear wall running perpendicular with Helifix ties or similar to provide a lateral restraint at each junction. Where possible it would also be prudent to carry out some local stitch repairs between walls. The depths of the existing foundation and proposed underpinning or new foundations are all subject to the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

4 CONCLUSION AND RECOMMENDATIONS

Ground Floor – The new foundations and underpinning will provide the option to construct a new ground floor with insulation to meet current Building Regulation Standards.

Roof – New timber rafters would need to be provided to strengthen the existing roof to be able to support the roof covering, insulation and plasterboard and provide a level datum to recover the roof and straighten the ridge line. New ceiling collars/ties would also need to be installed to prevent or limit any future spread at the eaves level. Subject to a timber survey and a detailed design there may be areas where existing timbers need to be locally cut away and new sections of timber inserted. The roof structure would need to be fully strapped to all walls with galvanized mild steel restraint straps @ maximum 1200mm centers.

General – We would recommend a series of trial pits be dug to be able to determine the depth and profile of the existing foundations and type of bearing strata. It is also recommended that a timber survey be carried out by a specialist company to be able to identify the condition of the existing timber members. All external walls would need to be repointed. Subject to the confirmation of the type of soil and its plasticity index combined with the proximity and type of any nearby trees, the depth of the underpinning would need to comply to the depth requirements as per the NHBC Standards. It is recommended that any existing timber lintels be replaced with either precast pre-stressed concrete or Catnic type lintels. Helifix ties or similar are to be provided across any cracked joints between brickwork walls and flint walls.

It is concluded that we see no structural reason why the existing structure for building 1 cannot be retained and sufficient strengthening works be adopted to convert this building into a habitable building. This is however subject to the results of trial pits, timber survey and a full detailed design.

Building 2

Front Wall – The front brickwork wall appeared to be in relatively good condition with diagonal cracking locally over the doors, it is suggested this cracking is localized only and not due to any settlement in the ground. It is recommended new Catnic or similar lintels are installed for all openings. The elevation would need to be fully repointed. At this stage it is not considered a requirement to underpin this wall unless the removal of the ground floor and/or introduction of a new slab and insulation and lowering of the slab undermines the existing foundations. This is also subject to a detailed design and load assessment on the existing foundations once the depth and profile of the existing foundations and type of bearing strata is known. If following the detailed design of this load assessment foundation strengthening is required, this this would be in the form of underpinning. The depths of the existing foundation and proposed underpinning or

4 CONCLUSION AND RECOMMENDATIONS

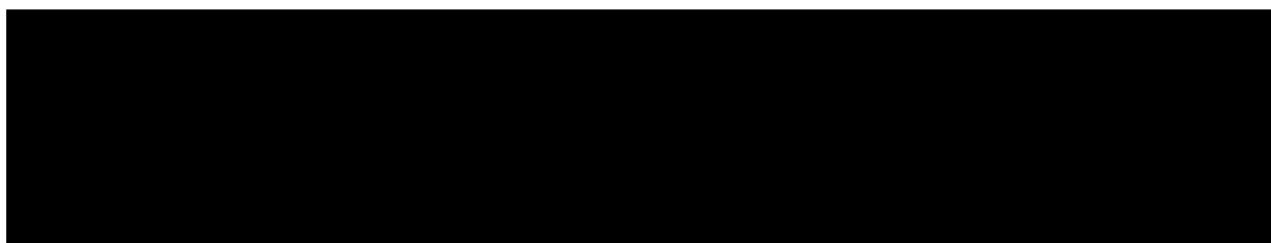
new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Rear Wall – The rear wall appeared to be in relatively good condition. It is recommended new Catnic or similar lintels are installed for any new openings. The elevation would need to be fully repointed. At this stage it is not considered a requirement to underpin this wall unless the removal of the ground floor and/or introduction of a new slab and insulation and lowering of the slab undermines the existing foundations. This is also subject to a detailed design and load assessment on the existing foundations once the depth and profile of the existing foundations and type of bearing strata is known. If following the detailed design of this load assessment foundation strengthening is required, this this would be in the form of underpinning. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

End/Side Walls – It is recommended that these walls may require underpinning to provide a good solid foundation to each wall due to the cracking visible. This underpinning may need to be extended around the corners of the front and rear walls to a degree to avoid any hard spots and future cracking. This is however subject to more intrusive investigation works with regards to the existing foundations. It is recommended a series of trial pits be dug to be able to ascertain the depth and profile of the existing foundation and the type of bearing strata. Helifix ties or similar to are to be installed across the cracks together with replacement of any cracked bricks. However, if the front and rear walls require underpinning as described above, it would be prudent and advisable to also underpin these walls to avoid any hard spots and potential long term cracking. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Ground Floor – The requirement for a new ground floor and insulation combined with the required level of the ground floor to meet Building Regulations Standards may impact on the underpinning requirement to the external walls. If this requirement undermines the existing foundations, then all walls would require underpinning.

First Floor – A design check would need to be undertaken on the existing timber beams and joists to ensure they are sufficient for proposed dead and live load requirements. If they are deemed to be insufficient, they can either be strengthened or replaced to suit. It is recommended that the timber bearers under the ends of each timber beam are replaced with concrete padstones.



4 CONCLUSION AND RECOMMENDATIONS

Roof – New timber rafters may need to be provided to strengthen the existing roof to be able to support the roof covering, insulation and plasterboard and provide a level datum to recover the roof and straighten the ridge line. New ceiling collars/ties may also need to be installed to prevent or limit any future spread at the eaves level. The introduction of new ceiling collars is subject to a detailed design as these may not be required for this roof. Subject to a timber survey and a detailed design there may be areas where existing timbers need to be locally cut away and new sections of timber inserted. The roof structure would need to be fully strapped to all walls with galvanized mild steel restraint straps @ maximum 1200mm centers.

General – We would recommend a series of trial pits be dug to be able to determine the depth and profile of the existing foundations and type of bearing strata. It is also recommended that a timber survey be carried out by a specialist company to be able to identify the condition of the existing timber members. It is recommended that any existing timber lintels be replaced with either precast pre-stressed concrete or Catnic type lintels.

It is concluded that we see no structural reason why the existing structure for building 2 cannot be retained and sufficient strengthening works be adopted to convert this building into a habitable building. This is however subject to the results of trial pits, timber survey and a full detailed design.

Building 3

Front Wall – The front brickwork/flint walls with would need to be underpinned to be able to provide a good firm foundation. Any new wall would need to be built off a new foundation that would be constructed between the underpin sections for the existing walls. The new walls would then provide a good solid support for the roof with new Catnic or similar lintels as required for any new windows or doors. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Rear Wall – The rear wall has been pushed outwards by the spread of the roof, therefore it is recommended this wall be underpinned along its full length to provide a good firm foundation. Any new openings within this wall would need to be supported with Catnic or similar lintels. The rear wall is to be fixed back to the internal and side walls running perpendicular to the rear wall with Helifix ties or similar to provide a lateral restraint at each junction. Where possible it would also be prudent to carry out some local stitch repairs between walls. The depths of the existing foundation and proposed underpinning or new foundations are all subject the

4 CONCLUSION AND RECOMMENDATIONS

depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Internal/Side Walls – All original internal and side walls that are to be retained are to be underpinned to provide a good solid foundation to each wall. These walls are to be fixed back to the rear wall running perpendicular with Helifix ties or similar to provide a lateral restraint at each junction. Where possible it would also be prudent to carry out some local stitch repairs between walls. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Ground Floor – The new foundations and underpinning will provide the option to construct a new ground floor with insulation to meet current Building Regulation Standards.

Roof – New timber rafters would need to be provided to strengthen the existing roof to be able to support the roof covering, insulation and plasterboard and provide a level datum to recover the roof and straighten the ridge line. New ceiling collars/ties would also need to be installed to prevent or limit any future spread at the eaves level. Subject to a timber survey and a detailed design there may be areas where existing timbers need to be locally cut away and new sections of timber inserted. The roof structure would need to be fully strapped to all walls with galvanized mild steel restraint straps @ maximum 1200mm centers.

General – We would recommend a series of trial pits be dug to be able to determine the depth and profile of the existing foundations and type of bearing strata. It is also recommended that a timber survey be carried out by a specialist company to be able to identify the condition of the existing timber members. All external walls would need to be repointed. Subject to the confirmation of the type of soil and its plasticity index combined with the proximity and type of any nearby trees, the depth of the underpinning would need to comply to the depth requirements as per the NHBC Standards. It is recommended that any existing timber lintels be replaced with either precast pre-stressed concrete or Catnic type lintels.

It is concluded that we see no structural reason why the existing structure for building 3 cannot be retained and sufficient strengthening works be adopted to convert this building into a habitable building. This is however subject to the results of trial pits, timber survey and a full detailed design.

4 CONCLUSION AND RECOMMENDATIONS

Building 4

Front Wall – The front brickwork wall appeared to be in relatively good condition with only cracking apparent at the junction of the brickwork and flint sections of wall. Helifix ties or similar are to be provided across any cracked joints between brickwork walls and flint walls. It is recommended new Catnic or similar lintels are installed for all openings. The elevation would need to be fully repointed. At this stage it is not considered a requirement to underpin this wall unless the removal of the ground floor and/or introduction of a new slab and insulation and lowering of the slab undermines the existing foundations. The timber frame around the main door opening is to be either strengthened and treated or replaced with a galvanized steel frame. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Rear Wall – The rear wall could not be inspected in detail due to the vegetation growth. However, it is recommended new Catnic or similar lintels are installed for any new openings. Also, the elevation would need to be fully repointed. At this stage it is not considered a requirement to underpin this wall unless the removal of the ground floor and/or introduction of a new slab and insulation and lowering of the slab undermines the existing foundations. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

End/Side/Internal Walls – At this stage it is not considered a requirement to underpin these walls unless the removal of the ground floor and/or introduction of a new slab and insulation and lowering of the slab undermines the existing foundations. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Ground Floor – The requirement for a new ground floor and insulation combined with the required level of the ground floor to meet Building Regulations Standards may impact on the underpinning requirement to the external walls. If this requirement undermines the existing foundations, then all walls would require underpinning.

Future First Floor – If a new first floor is required within the main building part, then it is recommended this be provided by a new independent steel frame. This steel frame would have a series of columns which would be supported off new pad foundations (subject to the bearing strata) and timber floor joists. This would result in no additional load being transferred onto the existing walls. This new frame would then be fixed back to

4. CONCLUSION AND RECOMMENDATIONS

the existing walls to provide lateral support to the existing walls with slotted holes, so that it only provide lateral restraint and not transfer any vertical load.

Existing First Floor – If this section of floor is to be retained, a design check would need to be undertaken on the existing steel beams and joists to ensure they are sufficient for proposed dead and live load requirements. If they are deemed to be insufficient, they can either be strengthened or replaced to suit. The first floor structure would then be fixed back to the existing walls to provide lateral support to the existing walls with slotted holes, so that it only provide lateral restraint and not transfer any vertical load.

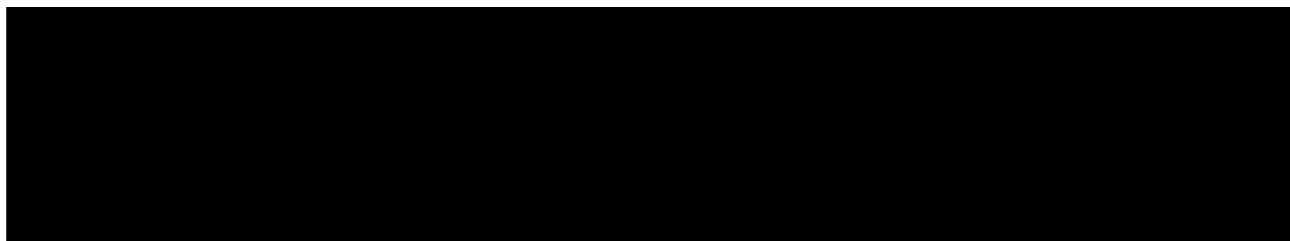
Roof – New timber rafters may need to be provided to strengthen the existing roof to be able to support the roof covering, insulation and plasterboard and provide a level datum to recover the roof and straighten the ridge line. New ceiling collars/ties may also need to be installed to prevent or limit any future spread at the eaves level. The introduction of new ceiling collars is subject to a detailed design as these may not be required for this roof. Subject to a timber survey and a detailed design there may be areas where existing timbers need to be locally cut away and new sections of timber inserted. The roof structure would need to be fully strapped to all walls with galvanized mild steel restraint straps @ maximum 1200mm centers.

General – We would recommend a series of trial pits be dug to be able to determine the depth and profile of the existing foundations and type of bearing strata. It is also recommended that a timber survey be carried out by a specialist company to be able to identify the condition of the existing timber members. It is recommended that any existing timber lintels be replaced with either precast pre-stressed concrete or Catnic type lintels.

It is concluded that we see no structural reason why the existing structure for building 4 cannot be retained and sufficient strengthening works be adopted to convert this building into a habitable building. This is however subject to the results of trial pits, timber survey and a full detailed design.

Building 5

Front Wall – The front brickwork/flint walls can be retained and underpinned to provide a good firm foundation, the existing timber cladding would need to be demolished and rebuilt, as they are not in very good condition and it is assumed there are no or minimal foundations supporting these walls. The posts supporting the main timber trusses are to be underpinned to be able to provide a good firm foundation. The new wall would need to be built off a new foundation that would be constructed between the underpin sections for the posts. The new walls would then provide a good solid support for the roof with new Catnic or



4 CONCLUSION AND RECOMMENDATIONS

similar lintels as required for any new windows or doors. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Rear Wall - The rear wall could not be inspected in detail due to the vegetation growth. However, it is recommended new Catnic or similar lintels are installed for any new openings. Also, the elevation would need to be fully repointed. At this stage it is also recommended that this wall be fully underpinned to provide a good firm foundation, this is subject to determining the depth and profile of the existing foundations and bearing strata. Additionally this underpinning will allow the removal of the ground floor and/or introduction of a new slab and insulation and lowering of the slab which may undermine the existing foundations. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Internal/Side Walls – All original internal and side walls that are to be retained are to be underpinned to provide a good solid foundation to each wall. These walls are to be fixed back to the rear wall running perpendicular with Helifix ties or similar to provide a lateral restraint at each junction. Where possible it would also be prudent to carry out some local stitch repairs between walls. The depths of the existing foundation and proposed underpinning or new foundations are all subject the depth requirement for foundations in line with the NHBC Standards in relation to the soil type, plasticity of the soil and proximity and type of trees.

Ground Floor – The new foundations and underpinning will provide the option to construct a new ground floor with insulation to meet current Building Regulation Standards.

Roof – New timber rafters would need to be provided to strengthen the existing roof to be able to support the roof covering, insulation and plasterboard and provide a level datum to recover the roof and straighten the ridge line. New ceiling collars/ties would also need to be installed to prevent or limit any future spread at the eaves level. Subject to a timber survey and a detailed design there may be areas where existing timbers need to be locally cut away and new sections of timber inserted. The roof structure would need to be fully strapped to all walls with galvanized mild steel restraint straps @ maximum 1200mm centers.

General – We would recommend a series of trial pits be dug to be able to determine the depth and profile of the existing foundations and type of bearing strata. It is also recommended that a timber survey be carried out by a specialist company to be able to identify the condition of the existing timber members. All external walls would need to be repointed. Subject to the confirmation of the type of soil and its plasticity index

4 CONCLUSION AND RECOMMENDATIONS

combined with the proximity and type of any nearby trees, the depth of the underpinning would need to comply to the depth requirements as per the NHBC Standards. It is recommended that any existing timber lintels be replaced with either precast pre-stressed concrete or Catnic type lintels. Helifix ties or similar are to be provided across any cracked joints between brickwork walls and flint walls.

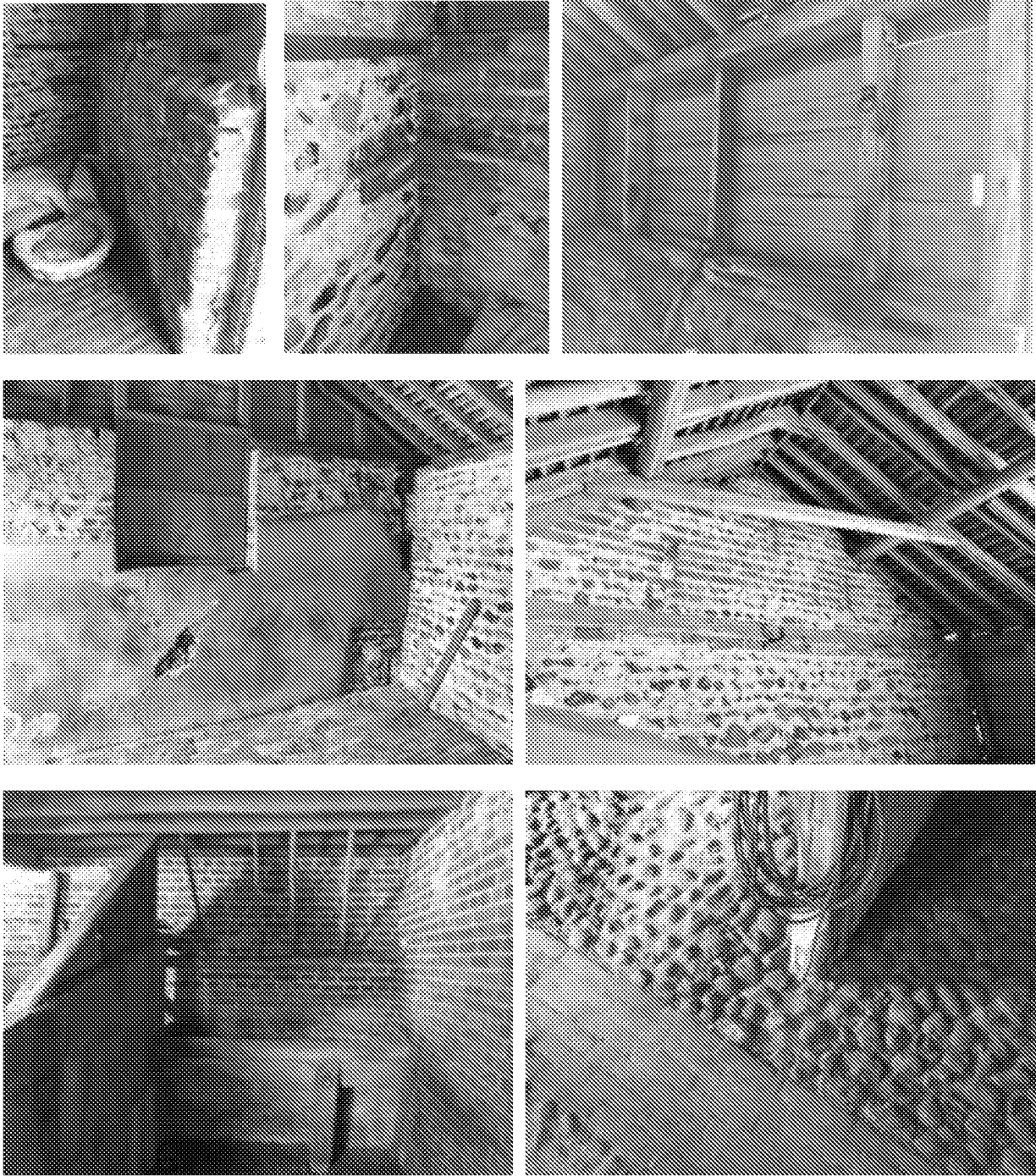
It is concluded that we see no structural reason why the existing structure for building 5 cannot be retained and sufficient strengthening works be adopted to convert this building into a habitable building. This is however subject to the results of trial pits, timber survey and a full detailed design.

The structural stability of each building is currently provided by masonry shear walls. If any existing masonry walls are to be removed during the renovation works, stability frames will need to be designed and detailed to replace these stability walls.

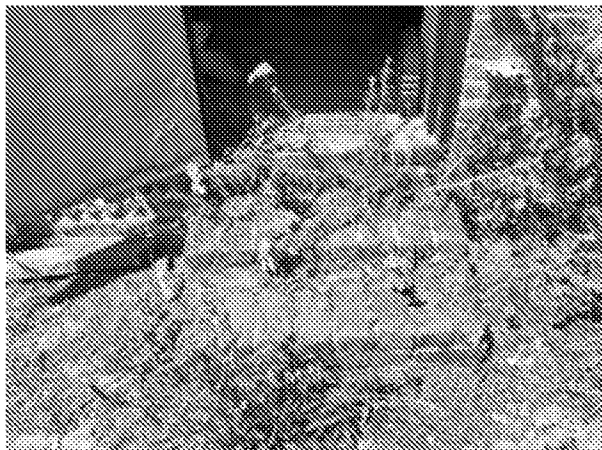
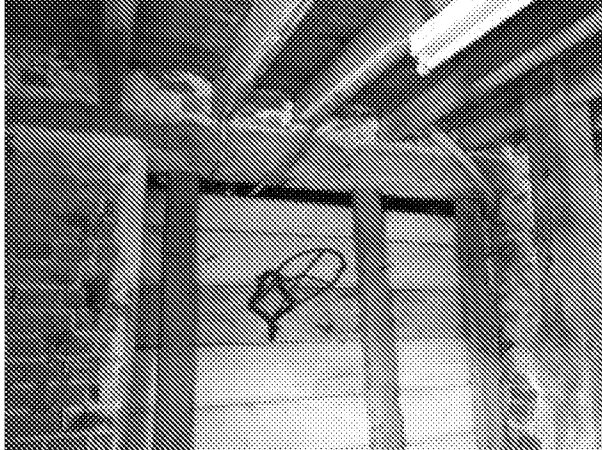
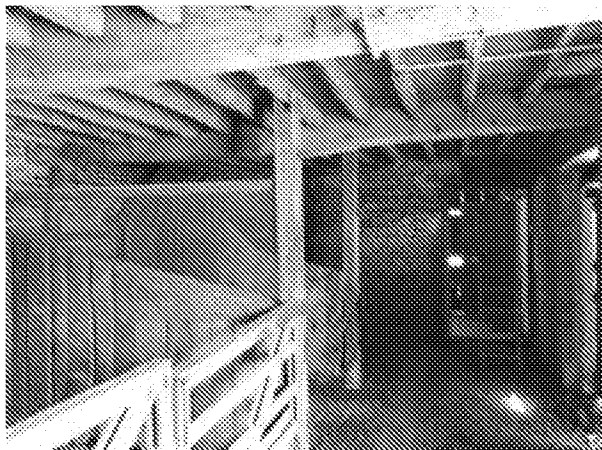
A method statement for the proposed works would need to be provided by the main contractor to ensure the existing building is safe during the construction stage of the works in the temporary condition.

4 CONCLUSION AND RECOMMENDATIONS

Additional Photographs:-



4 CONCLUSION AND RECOMMENDATIONS



4 CONCLUSION AND RECOMMENDATIONS

