

STRUCTURAL REPORT

**THE PROPERTY:**

Bank House Farm, A628
Silkstone, Barnsley
S75 4FZ

PREPARED BY:

Ray Panther
CSRT

REPORT REFERENCE

NE5559

PREPARED FOR:

Chris Carr

SURVEY DATE:

20th July 2021

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STRUCTURAL REPORT ON Bank House Farm, A628, Silkstone, Barnsley, S75 4FZ

Prepared By: Ray Panther
CSRT

Approved By: Andrew Russell
BSc(Eng), MSc, DIC, CEng,
MIStructE, MICE

Signed: 

Signed: 

Date: 9th August 2022

Date: 9th August 2022

Issue	Revision	Revised by	Revised Date
01	Rev A	Ray Panther	9th August 2022

The appointment of Structural Surveys Ltd shall be governed by, and construed in all respects, in accordance with the laws of England and Wales and each party submits to the exclusive jurisdiction of the Court of England & Wales.

CONTENTS

- A Survey Summary
- B Details of Instruction
- C About the Property
- D External Observations
- E Internal Observations
- F Commentary
- G Conclusions
- H Recommendations
- I Limitations

A Survey Summary

Our recommendations are summarised below. Full details are presented within the body of the report.

We have categorised any observed defects as follows:

Rating	Definition
3	Defects that are serious and require repair, replacement or further investigation urgently
2	Defects that need repairing or replacing, but are not considered serious or urgent
1	No repair is currently needed

Recommendations

3

A. Due to extensive weathering, loose masonry and distortions to the brickwork chimney stack of the main building, we would recommend that future refurbishment of the property allows for taking down and rebuilding the stack.

Rev A - This should include the severely weathered gable walls of the main building where voiding is present and stability cannot be guaranteed.

B. It is recommended that the extensions are carefully taken down and the materials recovered, sorted and stock piled for reuse. Rebuild the extensions on new suitable foundations. Allow for importing any additional local materials to replace the highly weathered masonry units / defective materials.

2

C. The rainwater pipes which presently discharge directly to ground should be re-directed to discharge at least 5m away from the foundations of the building and 2.5m from a boundary into a soakaway(s). Soakaway to be excavated 1m x 1m x 1m and lined with a geo-textile membrane, prior to infilling with broken brick. Top of infill to also be covered with a geo-textile membrane, prior to topping over with turf. Gully pot, with rodding access to be installed at foot of the rainwater down pipe, and connected into the new soakaway using 110mm diameter UPVC, buried pipe.

D. Appoint a specialist drainage contractor to carry out a detailed CCTV survey of the underground drainage system to confirm the extent and location of any

defects, and to carry out any associated repairs to eliminate the risk of escape of water from the drains into the surrounding sub-soils.

B Details of Instruction

Address of Property Surveyed	Bank House Farm, A628, Silkstone, Barnsley, S75 4FZ
Client Name	Chris Carr
Client Address	Bank House Farm, A628, Silkstone, Barnsley, S75 4FZ
Terms of Reference	To investigate and report on the following specific aspects to the property:- stability and integrity of the two rear gabled extensions. This report covers no other aspects of the property and, as instructed, is not a full structural report.
Date of Instruction	20th July 2021
Other Information	As part of Rev A of this report we have incorporated additional information pertaining to the condition of the gable walls that were subject to rebuilding works due to poor condition and risk of instability. These walls were not inspected by ourselves directly at the time of our inspection, however photographs were supplied by The Client.
Conditions of Engagement	Association of Consultancy and Engineering, ACE 2009, Agreement No.2 (Advisory and Investigatory Services).

C About the Property



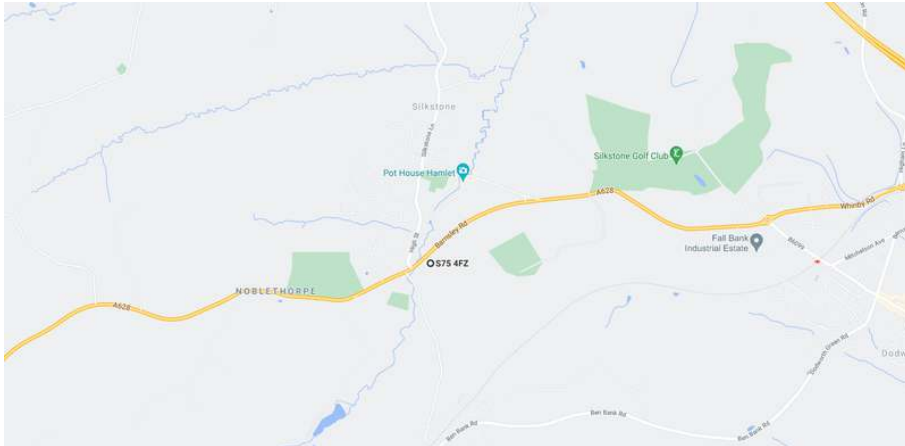
Bank House Farm

C.1 Description of Property

The property is a traditional, stone built, detached farmhouse with a multi pitched roof. We understand that the property is Grade II listed.

The age of the original property is 1805 as shown by a date stone in the front of the main building. The rear extensions, subject to this specific defect inspection report will have are likely to have been constructed during the early 1800's.

C.2 Location



The property is located approximately 4 miles west of the centre of Barnsley.

C.3 Local Environment

C3.1 Geology

British Geological Survey (BGS) maps do not indicate the immediate superficial deposits that are likely to be supporting the building foundations, however nearby borehole logs would indicate clay soils. The bedrock below this is Pennine Lower Coal Measures Formation, comprising mudstone, siltstone and sandstone sedimentary bedrock.

C3.2 Mining and Mineral Extraction

Reference to the Coal Authority Maps, indicates that this property may lie within influencing distance of past or current coal or mineral workings, or that there are workable coal or mineral reserves in the locality of the property, which could be mined in the future. The Coal Authority recommends that a Mining Report (CON 29M) is obtained for this property to confirm the current status of associated surface ground movement or to confirm whether there are proposals to mine these reserves in the future.

C3.3 Other

The Property is a Grade II listed property with the following listing details given upon the Historic England website:

House. Dated 1806. Coursed squared stone with quoins. Stone slate roof. Two storeys. Two-bay symmetrical front with central, Gothic-arched doorway. Two-light square-headed windows with cusped lights, traceried on ground floor. Band between floors. Central first floor plaque with date. Ashlar stack to left with string and cornice. Altered stack to right. Two storey wing to rear.

Interior not inspected.

The building was formerly "The Angel" public house.

The two storey wing to the rear is the subject of this specific defect inspection report, split into and referred to as the 'left' and 'right' extensions.

D External Observations

D.1 The Site

1

D1.1 Topography:

The level of the site generally falls from the rear down to the front. The variation in level is estimated to be between 0.5m and 1m across the site. There are no significant retaining structures within influencing distance of the property and the boundary walls that serve to retain the ground along the rear of the property and right hand side are not within an influencing distance of the property foundations.

There is considered to be no risk of slope instability of the site.



Photograph - 3 - Front of property



Photograph - 4 - Rear boundary walls

1

D1.2 Trees:

There is no significant vegetation growing within influencing distance of the property.

At the time of our inspection, the trees, shrubs and hedges located local to the building do not appear to be having an adverse effect on the property foundations. However, as a matter of risk mitigation, it would be prudent that all significant vegetation located upon the site is regularly maintained, such as lopping or pruning to restrict growth and overall height.



Photograph - 5 - Vegetation to front

2

D1.3 Drainage:

It was noted that the rain water downpipes to the building generally discharge direct to ground, typically local to the building corners. This is not considered to be a good detail and can put the property at risk of structural movement. Such an arrangement increases the risk of a concentration of water to enter the ground local to the foundations and cause wash out of fines from within the granular soils. This discharge arrangement will require altering to ensure the water is diverted and discharges away from the walls of the property into the underground system or suitably sized and located soakaways.

A property of this age is likely to have the original, vitrified clay pipes, which are brittle and susceptible to damage. Ground movements throughout the life time of the property can cause cracking to the pipes and also displacement of the pipe joints. Both forms of damage will allow escape of water into the surrounding soils, which in turn can cause localised softening of clay soils below adjacent foundations, or washing away of granular soils such as sand, if present.

In view of this, it is recommended that the condition and integrity of the underground drainage system is further investigated by a specialist CCTV survey.



Photograph - 6 - Typical discharge to ground

D.2 The Building

2

D2.1 Extension Roof Structures:

The roofs of the rear two extensions are gabled, pitched timber framed structures, finished with large format stone tiles.

Observations from ground level did not identify any excessive distortions to the roof slopes, however observations of the inner facing pitches was restricted due to the site constraints.

Observations along the right hand eaves line of the right hand extension identified a degree of lateral movement, typically associated with roof spread. An internal inspection of this roof structure identified that timber ties have been installed to resist this lateral movement.



Photograph - 7 - Left hand slope



Photograph - 8 - Restricted views



Photograph - 9 - Rear eaves line

2

D2.2 Extension Roof Coverings :

The gable edges are highly weathered, particularly to the left hand extension.

The roof line elements, such as gutters and downpipes are in need of replacement.



Photograph - 10 - Roof verge

1

D2.3 Walls:

The external walls of the extensions, subject to this specific defect inspection report, are of rubble filled stone construction with an overall wall thickness of approximately 450mm. With this form of construction, the outer leaf is often coursed stone 100mm thick, bonded in a lime mortar, the inner leaf is often brickwork or random stone, 100mm thick, and the central "gap" is usually infilled with loose rubble. There are usually "through stones" acting as wall ties, tying the inner and outer leafs together.



Photograph - 11 - Left extension left wall



Photograph - 12 - Left extension rear gable



Photograph - 13 - Left extension right wall



Photograph - 14 - Right extension left wall



Photograph - 15 - Right extension rear gable



Photograph - 16 - Right extension right wall

2

D2.4 Walls:

With rubble filled walls, as the fabric ages and naturally deteriorates the central rubble fill settles, the bonding of the through stones can fail, resulting in leaf separation, and the outer leaf can distort laterally, as a result.

There is evidence of leaf separation in this property as shown by distortions to the walls in general.

This has caused a general weakness in the external stonework leaves resulting in fractures extending down from the roof eaves, between openings and at poorly bonded construction interfaces.



Photograph - 17 - Right extension



Photograph - 18 - Right extension



Photograph - 19 - Right extension



Photograph - 20 - Right extension



Photograph - 21 - Right rear gable



Photograph - 22 - Left extension



Photograph - 23 - Left extension



Photograph - 24 - Left extension



Photograph - 25 - Left extension



Photograph - 26 - Left extension



Photograph - 27 - Left extension

2

D2.5 Walls:

As a result of the leaf separation and lateral displacement, the walls of the rear extensions generally tilt to varying degrees. On the right hand wall of the right extension this tilt was quantified using a spirit level as being up to 50mm over a vertical height of 1000mm.

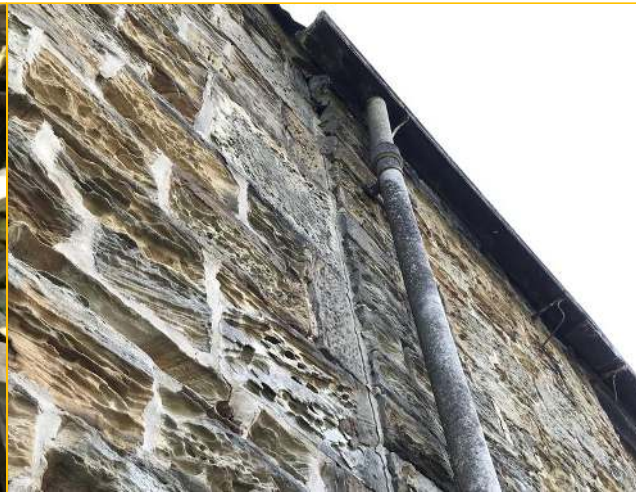
The vertical construction interface along this elevation has also displaced laterally in relation to the rear right hand corner of the original building.

The Building Research Establishment (BRE) Digest 475 - Tilt of Low-Rise Buildings, provides classifications for tilting to buildings. Tilting will generally become noticeable when it reaches around 1 in 250 to 1 in 200. Tilts of this magnitude are unlikely to have adversely affected the structural integrity of the house, however at the point of re-sale, they are likely to attract attention. Greater tilts than this are likely to affect the verticality of furniture, cause doors to swing open and possible issues with the falls to the internal plumbing and under ground drainage. As a guide, Digest 475 indicates that remedial works may be necessary for tilts around 1 in 100. As the tilt approaches 1 in 50, the building may be regarded as being in a dangerous condition.

In this instance, the measured tilt is 1:20.



Photograph - 28 - Extent of tilt



Photograph - 29 - Lateral distortions

2

D2.6 Walls:

On the left hand wall of the left hand extension, the door and window openings are generally out of square with sloping sills and lintels. This is indicative of some historic

structural foundation movement. This movement appears historic, however there residual distortions remain. Such distortions will affect future door and window replacements.



Photograph - 30 - Distortions

2

D2.7 Walls:

It was noted that the lintel to the ground floor window opening, in the left hand wall of the left hand extension, has limited bearing. A minimum of 150mm is recommended.



Photograph - 31 - Limited bearing

2**D2.8 Walls:**

On the rear wall corners of the two extensions there is evidence of past and more recent movement (shown by reopened repairs), between the wall panels and the corner quoin stones. The recent movement is not significant at this time but will progress with age.



Photograph - 32 - Right extension

Photograph - 33 - Right extension



Photograph - 34 - Left extension



Photograph - 35 - Left extension



Photograph - 36 - Left extension

2

D2.9 Walls:

The mortar pointing to all elevations is noted to be badly weathered. This has adversely affected the long term durability of the bed joints and perpend joints on the wall. The mortar has two functions. Firstly to bond the masonry together for strength purposes and secondly to provide a weather tight wall. As the joints weather, they will become susceptible to rainwater ingress, which may result in internal dampness and accelerate the overall deterioration of the wall.

The external masonry of the extension walls is highly weathered in areas with areas of past and non sensitive mortar render repairs. The stonework is generally friable to the surface where weathered.



Photograph - 37 - Weathered masonry



Photograph - 38 - Weathering



Photograph - 39 - Weathering



Photograph - 40 - Wrathering



Photograph - 41 - Weathering

3

D2.10 Chimney Stack:

Although beyond the scope of this specific defect inspection report, we would draw your attention to the poor condition of the brickwork masonry stack along the right hand gable wall of the original building. This stack is highly weathered with areas of loose material and significant distortions. We would recommend that you consider taking down and rebuilding this stack.



Photograph - 42 - Brickwork stack

3

D2.11 Main Side Gable Walls - Rev A:

It is noted that we did not complete a detailed visual inspection of the gable walls during our visit. The following commentary have been made from client supplied photographs. An this information is supplied as part of Rev A of this report.

From review of the photographs it is clear that the external stone masonry was highly weathered and voided in areas with significant section losses. Mortar pointing appears very limited in areas.



Photograph - 43 - Severe weathering



Photograph - 44 - Severe weathering



Photograph - 45 - Severe weathering



Photograph - 46 - Severe weathering



Photograph - 47 - Severe weathering



Photograph - 48 - Severe weathering



Photograph - 49 - Severe weathering

E Internal Observations

E.1 Main Building

1

E1.1 Roof:

The roof structures to the extensions are exposed within the first floor rooms as the ceilings have been removed. The roof structures are timber framed comprising king post trusses supporting purlins. The left hand extension roof is framed into the original rear roof slope and with intermediate support provided to the purlins by timber struts. The right hand extension roof has a Queen post truss supporting the purlins over the original building.

Internal observation of the main purlins and rafters indicates deflections within acceptable limits and no evidence of structural distress. The roof structure appears stable and sound.



Photograph - 50 - Left hand extension roof



Photograph - 51 - Right hand extension roof

2

E1.2 Roof:

There are several areas where day light can be seen through the tiled roof covering. This will allow the ingress of rainwater and pose a risk of decay to the timber roof structure. Remedial action is required as part of any future property refurbishment.



Photograph - 52 - Areas of daylight



Photograph - 53 - Areas of daylight

2

E1.3 First Floors :

The first floors are of suspended timber construction with joists supported by intermediate beams. These floors were generally found to be reasonably robust underfoot, however there were generally out of level and uneven.

Part of the floor to the left hand extension has been subject to historic fire damage, however the damage was minimal charring and the overall integrity of the floor structure has not been compromised.

Several joists in the left hand extension were provided with insufficient bearing due to historic movements within the property.



Photograph - 54 - Left hand extension floor



Photograph - 55 - Limited bearing

2

E1.4 Ground Floors :

The solid stone ground floors were generally uneven underfoot.

2

E1.5 Walls:

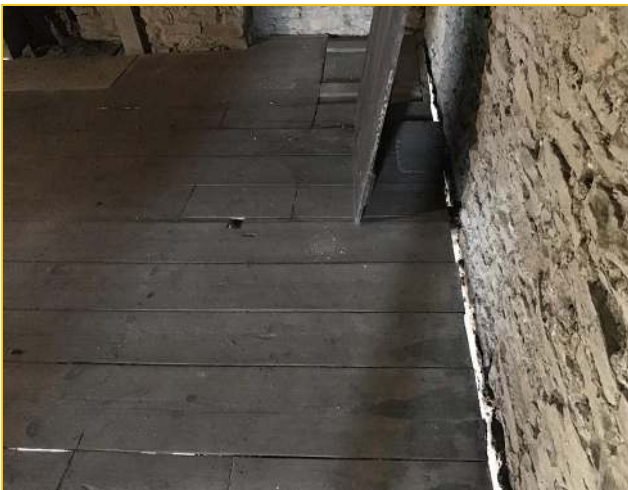
The internal walls within the rear extensions have been stripped of the internal finishes. Observations around the first floor room perimeters identified evidence of lateral movement of the external walls. This was shown by separation between the walls and the floor boards.



Photograph - 56 - Roth hand extension



Photograph - 57 - Left hand extension



Photograph - 58 - Left hand extension

2

E1.6 Walls:

At the construction interface, between the main original rear elevation wall and the flank walls of the extensions, identified separation fractures, up to 50mm in width. No structural bonding was apparent at the interfaces.



Photograph - 59 - Left hand extension



Photograph - 60 - Left hand extension



Photograph - 61 - Right hand extension

2

E1.7 Walls:

At the rear wall corners there is a degree of vertical fractures that generally trend to reflect those noted externally at the quoin to wall panel interfaces. This shows full depth fractures.



Photograph - 62 - Right hand extension



Photograph - 63 - Right hand extension



Photograph - 64 - Left hand extension



Photograph - 65 - Left hand extension



Photograph - 66 - Left hand extension



Photograph - 67 - Right extension

2**E1.8 Walls:**

Looking throughout the first floor areas of the extensions there are fractures and separations to the internal stonework, general extending from the various openings. Some areas of the masonry are loose locally.



Photograph - 68 - Left extension



Photograph - 69 - Right extension



Photograph - 70 - Right extension

2**E1.9 Walls:**

Similarly at ground floor level fractures are evident to the internal faces of the external walls that trend to reflect the fractures noted externally.



Photograph - 71 - Reflected fracture



Photograph - 72 - Reflected fracture

2

E1.10 Walls:

The timber lintels that spanned the external window openings were generally noted to display evidence of wood destroying insect damage and areas of historic decay. Allowances should be made for replacement or treatment of the timbers as part of any future property refurbishment works.



Photograph - 73 - Wood destroying insect damage

3

E1.11 Main Gable Walls - Rev A:

It is noted that we did not complete a detailed visual inspection of the gable walls during our visit. The following commentary have been made from client supplied

photographs. An this information is supplied as part of Rev A of this report.

From review of the photographs it is clear that the internal stone masonry was highly weathered and voided in areas with significant section losses. This had necessitated the use of brickwork infill repairs in several areas, including to the internal chimney breasts which rose up the gable walls. Mortar pointing appears very limited in areas.



Photograph - 74 - Voiding to chimney breast



Photograph - 75 - Loss of mortar

F Commentary

The rear extensions of the property are in poor overall structural condition showing a number of salient defects, deterioration and distortions. These features, when combined, are a risk to future long term structural integrity as the property ages. In this instance we are of the opinion that rebuilding works, utilising the existing materials, would be more favourable to repair and strengthening works. This is particularly relevant as the overall integrity of the external masonry has been affected by extensive weathering and age deterioration.

Rev A

Since our initial inspection the gable walls to the main property were taken down and rebuilt. We gave comment relating to this under separate cover as a letter report dated 27 July 2022 and referenced NE5559. The contents of this report were as follows:

Re: Rebuilding of Gable Walls at Bank House Farm

Further to our recent telephone conversation relating to rebuilding of the side gable walls at Bank House Farm, we would give our opinion and commentary on the completed works as follows:

Structural Surveys completed a specific defect structural inspection at the property on 20 July 2022. The specific instruction for this was stability and integrity of the two rear gabled extensions only. However, whilst on site we did note that the masonry of the right-hand chimney stack was severely distorted, weathered and with areas of loose material. As a result, and as a matter of a 'duty of care' we included a recommendation within our report to take down the stack and rebuild as part of the refurbishment works. This was item A within our recommendations as follows:

A. Due to extensive weathering, loose masonry, and distortions to the brickwork chimney stack of the main building, we would recommend that future refurbishment of the property allows for taking down and rebuilding the stack.

Our report then went on to recommend that the gabled projections, which were the subject of the specific defect inspection report, were taken down and rebuilt, reclaiming masonry units where possible. This was given as recommendation B within the report as follows:

B. It is recommended that the extensions are carefully taken down and the materials recovered, sorted, and stockpiled for reuse. Rebuild the extensions on new suitable foundations. Allow for importing any additional local materials to replace the highly weathered masonry units / defective materials.

From our discussion we understand that during the refurbishment works it was discovered that the integrity of the two side gable walls was poor. You explained that it was intended to remove and replace the highly weathered stone units within these elevations on an individual basis. However, as these were being removed it was discovered that the mortar had generally reverted to its natural state and had lost all strength and bonding characteristics. As units were being removed, we also believe that other units were collapsing, and that the rubble fill was settling. You informed us that a representative of the Local Authority, Building Control Department attended site and confirmed that the walls were at risk of instability and as a result were taken down and rebuilt.

It should be noted that our original specific defect structural inspection report on the building did not include the gable walls. It is also noted that we were not party to the above works relating to the assessment and subsequent rebuilding of the gable walls.

Notwithstanding the above, given the condition of the gabled extensions, which we recommend were taken down and rebuilt, and the condition of the right-hand stack, we are not totally surprised that there was excessive deterioration of the mortar which could result in a risk of instability within these gable elevations. This would also typically be exacerbated during disturbances caused by the refurbishment process.

It should be noted that the gable walls will also have incorporated the chimney flues. As a result, exhaust gasses within the flues typically causes accelerated deterioration of the mortar due to aggressive chemical attack and heat damage etc.

With refurbishment of a building of this age, it is often found that the refurbishment phase uncovers areas of excessive deterioration and more extensive works than were originally expected, often leading to rebuilding works, as undertaken in this instance.

We trust that the integrity of the gable walls has now been suitable restored through rebuilding and that this letter is suitable for your requirements.

G Conclusions

1. It is clear that the rear extensions have suffered historic structural foundation movement, leaving residual distortions to the superstructure. Based on our 'snap shot' visual inspection, we do not believe that this movement is progressive, however the historic movement has left weakness in the walls as a result of fractures and loss of structural bond.
2. The rear extensions of the property are considered beyond economic repair due to the historic movement, extensive weathering and age deterioration. This deterioration has affected the overall core strength of the external walls allowing the identified distortions and fractures causing a loss of structural continuity. Allowances should be made to rebuild the extension walls, faced in sound material to guarantee future integrity.
3. As part of any future property development, allowances should be to provide suitable drainage provisions for the foul and surface water systems to mitigate against any future risks to the buildings upon the site.
4. As the property is a Grade II listed building, any proposed works should be subject to listed building consent by the conservation department of the local authority.
5. Rev A - Based on the information provided and condition of the areas that were subject to inspection as part of our original report, we would confirm that rebuilding of the main gable walls was the most appropriate course of action to provide stability and long term integrity.

H Recommendations

- 3

A. Due to extensive weathering, loose masonry and distortions to the brickwork chimney stack of the main building, we would recommend that future refurbishment of the property allows for taking down and rebuilding the stack.

Rev A - This should include the severely weathered gable walls of the main building where voiding is present and stability cannot be guaranteed.
- 3

B. It is recommended that the extensions are carefully taken down and the materials recovered, sorted and stock piled for reuse. Rebuild the extensions on new suitable foundations. Allow for importing any additional local materials to replace the highly weathered masonry units / defective materials.
- 2

C. The rainwater pipes which presently discharge directly to ground should be re-directed to discharge at least 5m away from the foundations of the building and 2.5m from a boundary into a soakaway(s). Soakaway to be excavated 1m x 1m x 1m and lined with a geo-textile membrane, prior to infilling with broken brick. Top of infill to also be covered with a geo-textile membrane, prior to topping over with turf. Gulley pot, with rodding access to be installed at foot of the rainwater down pipe, and connected into the new soakaway using 110mm diameter UPVC, buried pipe.
- 2

D. Appoint a specialist drainage contractor to carry out a detailed CCTV survey of the underground drainage system to confirm the extent and location of any defects, and to carry out any associated repairs to eliminate the risk of escape of water from the drains into the surrounding sub-soils.

I Limitations

- I1. Our survey is limited to the structural aspects of the building, such as the roof, floors, walls and foundations.
- I2. We have not inspected, nor reported on, non-structural elements such as windows, doors, rainwater goods and internal decorative finishes.
- I3. We have not inspected, nor reported on, the plumbing, heating system, electrical wiring, gas or water supplies to the building.
- I4. We have not inspected, nor reported on, the integrity of the underground drains or any on-site sewage treatment plants, cess pits, septic tanks. Specialist advice should be sought in this respect
- I5. Unless explicitly stated to the contrary, we have not carried out a dampness survey, or a timber infestation survey, and therefore cannot comment on these aspects of the building.
- I6. We have not inspected woodwork which is covered or any other concealed or inaccessible parts of the structure and therefore cannot report that any such part of the building is free from defect.
- I7. No comment is made in this report as to the presence of new or old mine workings or tunnelling, heavy metals, chemical, biological, electromagnetic or radioactive contamination or pollution, or radon, methane or other gases, underground services, or underground structures, springs and watercourses, sink holes or the like, noise or vibration, pollution, mould, asbestos or asbestos products.
- I8. Unless explicitly stated to the contrary, the void below the ground floor has not been examined and therefore we cannot give any opinion on the condition of materials under the floor.
- I9. For the avoidance of doubt, The Contracts (Rights of Third Parties) Act, 1999, shall not apply to this Contract.
- I10. Our service does not include for confirming the presence or not, of any invasive plant species that may be present on the site such as Japanese Knotweed, Giant Hogweed, Himalayan Balsam etc. This is outside our area of expertise.