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Your Ref:

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Dear Rob

## **THORNBUSH FARM, LIVERSEDGE FOLLOW-UP STRUCTURAL INSPECTION/REPORT**

Further to our recent discussions regarding the existing buildings on the Thornbush Farm site which are of interest to Kirklees Planning Department, and our previous structural report dated 02.11.2022, the requested H&S and temporary works measures have now been installed. The scaffolding was boarded out at two levels so we could inspect both the walling and the eaves/roof structure. Protective temporary roofing was also erected over the whole of the building footprint. Ladder access to this scaffolding was kindly provided.

The previous structural concerns regarding the risks of the current perimeter wall alignment and that of the north chimney have been addressed with part support provided by the installed scaffold arrangement.

We would confirm carrying out a further visual non disruptive structural inspection on Friday 03.02.2023 from the erected scaffolding to comment on the internal and external structural condition, the overall lateral stability of the various walling and any Health and Safety concerns which should be shared with the appropriate parties. We considered an internal inspection to be too dangerous due to the recorded major building and chimney defects.

The site is bounded by Windy Bank Lane to the south and south west of the site, whilst Second Avenue is to the north and north west. There is a Residential Estate to the north and east. As referred to in our previous letter report dated 02.11.2022, Building A is the Former Bronte Cottage. Buildings B, C and D are not the purpose of this report and hence are not referred to.

For reference purposes we have split Building A into the main Bronte Cottage which is the more substantial part of the building to the south and then a subsequent smaller extension to the north which includes the abovementioned north chimney.

Our structural inspection revealed the following:

### **1. General:**

- 1.1 The external inspection was carried out from both external ground level and from the erected scaffolding as referred to above. Internal inspection was not possible due to current structural condition of the property, however a restricted inspection was in part possible from the scaffolding due to the extent of roof/floor having collapsed.

- 1.2 The inspection was of a visual non-disruptive nature. We have not inspected any areas which were concealed, unexposed or inaccessible and hence cannot confirm that any such areas are free from defect.
- 1.3 For the purposes of reference, when this report refers to left hand and right hand sides it is when viewed from the outside.
- 1.4 This report should be read in conjunction with attached Photographs P1 to P39.

## **2. Main Bronte Cottage:**

- 2.1 The building appears to be a two storey property, however a ventilation grill on the front elevation either relates to a part basement or underfloor ventilation between ground floor level and the solum.  
The overall construction originally consisted of stone slab slates on a timber roof structure, a timber suspended floor at first floor level, masonry rubble filled perimeter walls and solid masonry internal walls.
- 2.2 Although there is a current gap between the Main Bronte Cottage and the associated farm buildings to the south, it is evident that there has been a similar building in this space in the past. Various pockets for timber supporting members are evident in the adjacent walling.
- 2.3 Roof Construction:  
All stone slab slates have been removed by others at some point in the past. There are the remains of various slates round the perimeter of the building such as shown in Photograph P13, or dropped to the first floor level below.
- 2.4 Timber Rafters/Purlins/Ridge Beam:  
The timber rafters are circa 75mm x 50mm at varying centres ranging between 420mm and 475mm, and can be classified as Grade C16 Timber. It was noted that each rafter has been numbered. Their condition appears varied, although we could only judge from the scaffolding. The bottom of the rafters adjacent to and at eaves level are for the most part in poor condition and locally rotten. The rafters are supported on timber purlins and a timber ridge beam.  
The rafters are no longer supported on a timber wall plate.  
The timber purlins spanning between the timber roof trusses or between the end wall and the roof trusses are generally in satisfactory condition, although we suspect that the section of purlin set into the masonry walling may be locally rotten.  
The timber ridge beam appears rotten over most of its length.
- 2.5 Timber Roof Trusses:  
There are two timber roof trusses over the length of the roof void to the Main Bronte Cottage.  
The condition of the south truss appears for the most part to be sound/ satisfactory although there are local areas of decay/deterioration.  
The north truss is not in such sound condition and is suffering from longer term decay and deterioration.
- 2.6 First Floor Level:  
The first floor has partially collapsed revealing the ground floor below. As access was not possible or permitted due to the current instability of the structure, we were not able to view the condition of the first floor joists. However as the roof has been open for many years and the top of the floor appears very wet, we would anticipate the floor joists are no longer structurally viable.
- 2.7 Front Elevation:  
The wall is overall circa 450mm thick with an outer and inner leaf plus rubble fill between.

The outer stone leaf is circa 150mm thick, however at one location this was as little as 80mm with a void behind where there should be rubble fill.

The condition of the outer face is for the most part very soft and crumbling. We removed this crumbling stonework at a number of locations back to more solid/robust stone and found this to be between 15mm and 20mm thick, thus leaving circa 130mm to 135mm thick sound stone. This may vary across the front elevation.

The front elevation has kicked out at the equivalent of first floor level by varying degrees with maximum outward displacement of circa 50mm to 75mm. This is most likely due to expansion of first floor joists from damp/water ingress. There are various cracks in the walling as a result of this movement.

There are also various other diagonal stepped cracks on the front elevation which are popping off the mortar pointing. This would normally suggest foundation movement/settlement, however may also be reflective of the varying degrees of displacement at first floor level and the potential resulting separation of the inner and outer leaves of masonry. A number of masonry bed joints and perpends are locally deficient.

There is significant vegetation at the head of the wall.

#### 2.8 Rear Elevation:

Due to some of the scaffold boards having blown off the scaffolding in the high winds, our access for close up inspection was limited.

The horizontal/vertical alignment of the top of the wall at eaves level varies over the length of the rear elevation, thus creating varying magnitudes of "out of plumb" dimension.

Various vertical or slightly diagonal cracking or open joints were evident at a number of locations.

We could not get up close to determine whether the inner and outer leaves were starting to separate or to inspect the condition of the rubble fill. We suspect based on our observations of the other perimeter walling, it is quite possible that this may be occurring.

A number of masonry bed joints and perpends are locally deficient.

There is significant vegetation in the former gutter at eaves level.

#### 2.9 South Gable:

The alignment of the outside face of the upper section of south gable is varied and distorted, more so than the inner face, thus suggesting some separation of inner and outer leaves of the rubble filled wall.

The former chimney head is parting company from the adjacent walling with some rotation evident. This rotation may in part be causing the abovementioned distortion.

### 3. Extension to the Bronte Cottage:

3.1 The building construction is as referred to above in Section 2.1.

#### 3.2 Roof Construction:

All stone slab slates have been removed by others at some point in the past. There are the remains of various stone slabs around the perimeter of this section of the building.

#### 3.3 Timber Rafters/Purlins/Ridge Beam:

The timber rafters are circa 75mm x 50mm at varying centres ranging between 440mm and 480mm, and can be classified as Grade C16 Timber. It was noted that each rafter has been numbered. Their condition appears generally decayed and in very poor condition, although we could only judge from the scaffolding. The bottom of the rafters adjacent to and at eaves level are locally rotten.

The rafters are no longer supported on a timber wall plate.

The timber purlins spanning between the timber roof trusses or between the end wall and the roof trusses are in mixed structural condition, although we suspect that the section of purlin set into the masonry walling may be locally rotten.

The timber ridge beam appears rotten over most of its length..

#### 3.4 Timber Roof Trusses:

There is one intermediate timber roof truss over the length of the roof void to the Extension.

The truss is in very poor condition and is suffering from longer term decay and deterioration.

#### 3.5 First Floor Level:

The first floor has completely collapsed to the ground floor below. This is in part due to rotten/ seriously decayed timber and part due to floor joists pulling out of the front elevation wall for the reasons provided below.

#### 3.6 Front Elevation:

The wall is overall circa 450mm thick with an outer and inner leaf plus rubble fill between. The outer stone leaf is circa 150mm thick.

The condition of the outer face is for the most part very soft and crumbling. We removed this crumbling stonework at a number of locations back to more solid/robust stone and found this to be between 15mm and 20mm thick, thus leaving circa 130mm to 135mm thick sound stone. This may vary across the front elevation.

The front elevation has kicked out at the equivalent of first floor level by varying degrees with maximum outward displacement of circa 160mm. The cause of this substantial kick out at first floor level is unknown, however the joists will have pulled out of the wall based on this horizontal displacement. This is very serious and if left unsupported would lead to collapse at some point in the very near future.

There are various cracks in the walling as a result of this movement.

There are also various other diagonal stepped cracks on the front elevation which are popping off the mortar pointing. This would normally suggest foundation movement/ settlement, however may also be reflective of the varying degrees of displacement at first floor level and the potential resulting separation of the inner and outer leaves of masonry. Adjacent to the north east corner, some of the low level masonry has dropped out and weakened the stone above with the resulting opening up of joints.

There is significant vegetation in the former gutter at eaves level and noticeable soft stone immediately below.

#### 3.7 Rear Elevation:

Due to some of the scaffold boards having blown off the scaffolding in the high winds, our access for close up inspection was limited.

The horizontal/vertical alignment of the top of the wall at eaves level varies over the length of the rear elevation, thus creating varying magnitudes of "out of plumb" dimension.

Various vertical or slightly diagonal cracking or open joints were evident at a number of locations.

Please also refer to Item 3.9 below. We have serious concerns about the stability of this wall which would lead to the collapse of the overall structure.

A number of masonry bed joints and perpendes are locally deficient.

There is significant vegetation in the former gutter at eaves level.

#### 3.8 North Gable:

The north gable is a stonework gable with an external brick chimney/chimney breast which may have been built at a subsequent time to the original cottage. There is evidence of a lean-to outhouse having been connected to the cottage at some point in the past, however this has either fallen down and/or been demolished.

The chimney head which was previously very unstable has been provided with temporary support for stability in the short term.

This area has been barriered off for H&S reasons.

The bowing of the walling on the front elevation is resulting in open joints and stonework trying to pull away on the line of the north gable.

The gable wall appears to be pulling away from the rest of the structure particularly around first floor level. This is not unusual of buildings of this particular era, where ties were not provided between the floor structure and the walling.

The dropping out of the stone next to the north east corner referred to above in Section 3.6 has disturbed the adjacent low level stonework on the north gable.

There are also open joints in the masonry at the north west corner indicative of the stress this part of the perimeter wall is under.

- 3.9 The inside leaf of the rear elevation as viewed from the scaffold has almost completely collapsed, thus releasing the rubble fill formerly between inner and outer leaves. The wall is effectively now a single leaf wall which is also in very poor structural condition as noted above. The failure of the remaining outer skin of the rear elevation wall would lead to the collapse of the overall structure.
- 3.10 This wall is very dangerous. Under no circumstances should anyone access the inside of this part of the property.
- 3.11 There is little remaining internal structure which would be providing supplementary lateral support to the front/rear elevations or the north gable.

#### **4. Conclusions:**

4.1 We have carried out a structural inspection from the installed scaffolding to the Bronte Cottage and it's previous Extension to advise both yourselves and the client on their current structural condition with regard to the current discussions with Kirklees Council Planning Department. We would summarise our thoughts as follows:

##### **4.2 Main Bronte Cottage:**

The overall structural condition of the Cottage is very poor and in parts dangerous. Under no circumstances is anyone to access the inside of the extension due to the following very serious defects:

- The outward displacement of the wall at the equivalent of the previous first floor level.
- The cracking and defective alignment of the front/rear elevations and the south gable.
- The perimeter walls have restricted or no lateral support at first floor level or roof level.
- Rotten timber roof elements.

It is likely that the part of the front elevation will need to be rebuilt and also part of the south gable wall. As we could not access the inside of the property to view the inner face of the rear elevation wall, we cannot confirm what remedial measures will be necessary.

The soft face of the outer leaf stonework will require removal with likely stone repairs being required.

##### **4.3 Extension to the Bronte Cottage:**

This part of the property is in a very dangerous condition and in considerable risk of collapse. Under no circumstances is anyone to access the inside of the extension due to the following very serious defects:

- The considerable outward displacement of the wall at the equivalent of the previous first floor level.
- The collapse of the inner leaf of the rear elevation wall has reduced the structure to a single leaf which is also defective.
- The perimeter walls have no lateral support at first floor level or roof level.
- Rotten timber roof elements.
- Issues still remain with the north gable chimney.

There is no avoiding the fact that the front and rear elevations will need to be rebuilt and also part of the north gable wall. However, this will require a new first floor level and replacement of most of the roof structure, and to be installed as the perimeter wall construction progresses.

The soft face of the outer leaf stonework will require removal with likely stone repairs being required.

- 4.4 From a Health and Safety viewpoint, please can you ensure that noone accesses the inside of either of the above properties for the reasons provided previously. Please ensure that the installed herras fencing remains in good order and is suitably secured for public and pedestrian protection.

Trust that the above is self-explanatory. We would be delighted to discuss further after you have had time to digest the contents of the report.

Yours sincerely

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