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LTR/18096/02/PMc

1<sup>st</sup> October 2018

Mr F Noon  
Yew Tree Cottage  
Hellifield Road  
Bolton by Bowland  
BB7 4NS

Dear Mr Noon,

**RE: 18096 – Yew Tree Cottage  
Structural Inspection**

Following planning consent for intrusive investigative works a small section of stone was removed for inspection, this revealed that at some point the historic chimney / range had been removed along with the flue to the full height of the wall.

On the inner leaf the opening has been infilled with modern blocks, straps had been introduced fixed to the outer leaf and built in to the new blockworks, on intrusive inspection these straps had simply bent allowing the external leaf to move outwards. To remedy this some remedial 'Heli fix' ties have been installed many of which had failed and pulled out from the inner leaf fixing.

The removal of the chimney left a void which allowed rubble fill to collapse and left the retaining element of the wall without lateral support.

Due to the above the outer leaf collapsed into the newly created void leaving the wall over unsupported and the bulge which was most likely present for some time becoming mobile and worsening. Through stones outside of the chimney location were seen to have split to the rear face of the outer leaf suggesting that the horizontal ties had facilitated a lateral migration of the movement due to the failure of the wall ties.

Initial inspection suggested that there were voids beneath the internal leaf blockwork wall which it was agreed on site with building control to introduce concrete between the inner and outer leaves to fill any present voids reinstating stability of the retained element and also allowing for block work to be added to the inner leaf to ensure continued support to the internal leaf, PWA are in agreement with these remedial works and it is understood that these have now been introduced to ensure long term stability of the inner leaf and retaining wall.

Inspection of the inner leaf elsewhere demonstrated minimal movement and appeared to be in good condition, though much of the original building fabric has been replaced with modern blockwork what could be seen of the remaining wall appeared to be well bonded and in good order.

The condition of the stonework is poor, a cement render / repointing has been applied over the gable which may well have accelerated degradation of the stone to the full gable.

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FS560604

### Remedial works

Immediate remedial works to ensure stability have been undertaken.

Any stones that can be reused should be carefully processed to remove any mortar / render and retained for reuse, this should be undertaken with manual tools to minimise any damage to individual stone.

In the inevitable event that not all the walling stone can be suitably salvaged an appropriate alternative should be sourced and approved via planning prior to any re construction works. Rebuilding of the affected area of the wall only should be undertaken taking care not to damage adjacent walling.

Reconstruction should be undertaken using a lime mortar (HLM 2.0-2.5) to reflect the original construction ensuring that colour and texture is matched as close as possible to the existing dwelling, again this should be agreed through planning. Trial mixes should be undertaken to determine best match to existing ensuring uniform dispersion of the lime through the mix.

Stainless steel wall ties should be introduced at 900mm horizontal and 450mm vertical centres fixed centrally to the block work mechanically fixed to the existing inner leaf and built into the outer leaf, a sliding wall tie may be required subject to coursing, wall ties must comply with the requirements set out in Eurocode 6 (BS EN1996-1-1:2005) minimum mortar strength HLM2.0

Following suitable reinstatement of the affected area it is strongly recommended that the remaining gable is removed of any render / poor pointing and repointed with the same lime mortar mix to minimise then potential for movement or accelerated degradation of the walling stone and return the gable to its original appearance.

The above works should be undertaken with the utmost care to not damage any unaffected areas with all work undertaken by suitably qualified personnel. Appropriate PPE must always be adopted with appropriate method statement and risk assessments provided by the chosen contractor.

We trust the above is suitable for your current requirements.

Should you require anything further at this stage please do not hesitate in contacting the undersigned.

Yours sincerely,



Paul McDonald  
Engineering Manager  
For and on behalf of Paul Waite Associates Ltd

CC: Geoff Curry



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