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Building Fabric Condition Assessment

PLANNING APPLICATION FOR THE CONVERSION OF A REDUNDANT GROUND FLOOR SHOP/RETAIL PREMISES (AND BASEMENT) CURRENTLY CLASS A2, FINANCIAL AND PROFESSIONAL SERVICES AT 1 CLERK BANK, LEEK ST13 5HE, INTO A RESIDENTIAL DWELLING

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Building Fabric Condition Assessment

Planning application for the conversion of a redundant ground floor shop/retail premises (and basement) currently class A2, financial and professional services at 1 Clerk Bank, Leek ST13 5HE into a residential dwelling

1. INTRODUCTION / CONTEXT

It is proposed to convert the existing ground floor former retail premises and basement into residential use. The first and second floor of the premises had been used as a residential flat, independent of the ground floor premises.

An Initial Structural Assessment had been carried out on the property on 25th March prior to purchase by Jonathon Cornes Associates, see copy appended at the rear of the document.

It is understood that structural work was carried out to the building and completed in February 2003. During the course of this work a masonry column was constructed from the basement floor to provide support to the underside of the second floor. A pair of steel beams were installed in the ground floor structure and new timber beams were installed throughout the ground floor retail area. Work was also carried out to the shop frontage, where upon a steel beam was installed above the shop window to provide support to the front wall.

2. INSPECTION

Works internally had begun stripping out the kitchen and bathroom fittings to the upper floor flat and also damaged dry lining plasterboard from the walls in preparation for an internal refurbishment, and rewire of the property.

The property was inspected on several occasions as the strip out work revealed further issues of concern

The inspections were carried out by

Andrew Dukesell MCIAT
DBD Architectural Consultancy Ltd
50 Broad Street
Leek
Staffordshire
ST13 5NS

On behalf of

MR P Whittaker

3. LIMITATIONS

3.1 The survey was non-intrusive, although work is progressing within the building expose the background structure.

3.2 The inspection was limited to a visual inspection only, both internally and externally as necessary and subject to safe and reasonable access being available. This report is made on the findings of an inspection made from the ground and from other easily accessible points.

3.3 It is emphasised that the inspection is purely visual; we have not inspected woodwork or other parts of the structure that are covered, unexposed, or inaccessible and we are therefore unable to report that any such part of the property is free from defect, however work has been carried out to expose the timbers in the floor zones and stud framing behind plasterboards

3.4 ASBESTOS-containing materials (ACM'S) ï DBD Architectural Consultancy are not qualified to advise on the presence, or otherwise, of any asbestos-containing materials, nor insured to do so. Asbestos is a highly regulated and licensed specialist area of work controlled by the Health & Safety Executive (HSE).

3.5 DBD Architectural Consultancy are not qualified to comment upon, Electrical systems, Heating Systems and reference to more Specialist advice should be sought. However, any such items apparent during the inspection that are observed have been identified as requiring further inspection.

3.6 Toxic Mould ï DBD Architectural Consultancy are not qualified to advise on the presence, or otherwise, of fungi, growth, mould, spores, mycotoxins of any kind, nor insured to do so. The building owner is advised to consult a specialist environmental monitoring or buildings diagnostics consultancy for further advice.

3.7 The survey is restricted to the demise of the building 1 Clerk Bank, comprising Ground, first and second floors, and basement

4. GENERAL DESCRIPTION

4.1 The building is a three storey brick built structure plus basement forming the corner of Church Lane and Clerk Bank. The building is adjoined at the rear to a four storey brick building, and to the left (as view from the front) to an elevated dwelling with a stone façade.

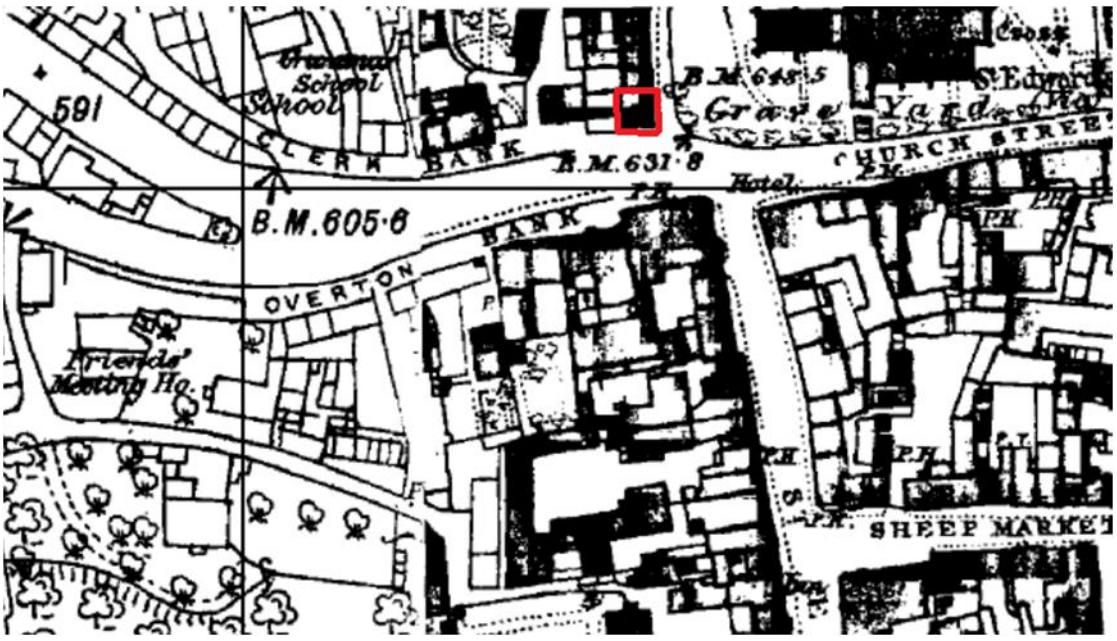
4.2 The date of original construction has not been determined, early photos dated back to 1859 referencing the new Coop office at 4 Clerk Bank, clearly show the building in the background, an early drawing of St Edwards Church dated 1844, also depicted what appears to be the outline of 1 Clerk Bank in the background.

4.3 During the course of investigation of the property it has been established that the neighbouring cruck frame forming the original structure to adjoining Grade II listed 2 Clerk Bank is present within the demise of 1 Clerk Bank. Consultation with SMDC Conservation Officer has resulted with the building becoming listed in its own right, and the principles of listed building conservation have been adopted.

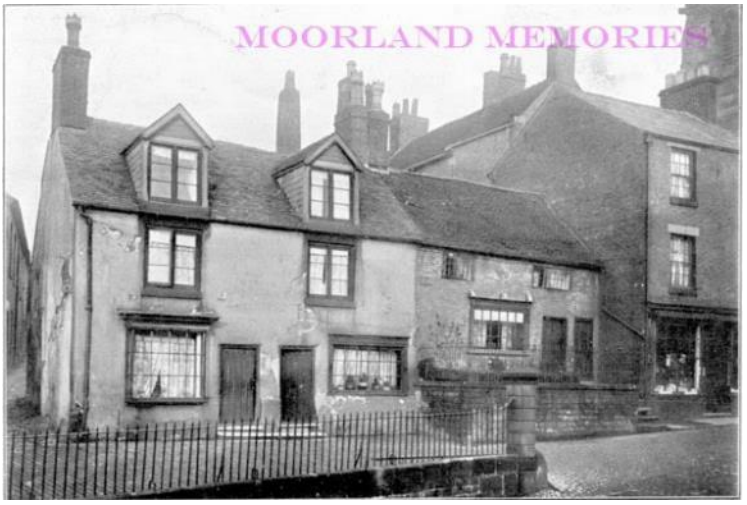
4.4 It is thought that the room occupied by the WC within the demise of the building was once a covered walkway to the rear of the property, however it is not certain when that ceased and the space become part of the demise of 1 Clerk Bank. A timber boarded door is visible from the outside, although inside it is plaster boarded and fitted with a small window looking out onto the rear of the timber panels

4.5 The building has been vacant for approximately 3 years.

4.6 Map below is an extract from C1879 of Leek town, showing the building on the corner of Church Lane and Clerk Bank



4.7 The image below is taken from website Moorlandmemoriessblogspot.co.uk taken in 1859, showing the boarded up doorway, now the WC serving 1 Clerk Bank, and also the shop front of 1 Clerk Bank having Georgian glazing bars.



4.8 The image below is taken from 'Leek through the ages' by Neil Collingwood, taken around 1950, again showing the Georgian window frontage

5. EXTERNAL OBSERVATIONS

5.1 The front right hand corner of the building is bowing out approximately 50mm wider around the area of the ground floor window lintel (shop signage), making the wall lean approximately 3 degrees off plumb at the base

5.2 The sides and rear of the building are brick faced, 9inch solid walls, there doesn't appear to be a particular pattern or regular bond to the brickwork, which is largely stretcher bond, with random courses having a header between the stretcher bricks, and then 5 or 6 courses without a header, and a course with a random header amongst the stretchers. The image below highlights the curve in the wall centred around the signage line.

5.3 The front of the building has been pebbled dashed rendered so defects in the brickwork are difficult to observe, however there is a crack in the render in the area of the signboard. At the time of the inspection it is difficult to determine whether the crack is superficial and pertains to the render only, or is a defect with the brick substrate below.

5.4 The front of the property has a row of concrete slabs approx. 450mm x 600mm beneath which is a void approx. 1.8m deep similar to the lightwells once common on pavements, generally fitted with a metal grille or thick glass blocks set in a cast iron frame.

6. INTERNAL OBSERVATIONS

6.1 The building is four storey in height to include the basement. The first and second floor were fitted out for a flat with kitchen and lounge on the first floor, with two bedrooms and a bathroom on the top floor. The floors in the upper floors were undulating and sprung quite heavily. When the floor boards were stripped back it was found the floor joists to be bordering on adequate size for the spans, in some instances the joists were cut too short to span onto the structure they were designed to take support from. The joists had bowed to the extent the floor boards had been levelled with tapered timber packers on the top of the joists. The image below shows the original joist falling short of the support beam. A new joist has been partnered to the side during the current works to provide support to the floor.

6.2 The image below shows a length of floor joist abutting another length of floor joist with no means of mechanical fix between the two timbers. The joist on the right is effectively cantilevered from the pocket in the external wall approximately 2.0m long. The joist in the background has also been cut short to allow the soil pipe to pass through the wall, and has been left with a short section of timber nailed to another batten fixed to the wall to take support from.

The image below indicated the build up of the first floor structure, the undersized joists have been packed and partnered over past years, holes and notches have been made for electrical and plumbing installation further weakening the structure, joints and joist connections have been poorly carried out, the historic springing/sagging of the floor has resulted in the joists being close to springing out of the seating/support, which allow sections of floor to fall.

6.3 There are visible signs of what appears to be dry rot fruiting bodies within the floor joists, both the earlier beams and later new timbers.

6.4 The existing ground floor has been relatively recently replaced, assumed to be part of the structural work carried out during February 2003, however existing / historic damp problems have not been addressed. The space has not been adequately ventilated exacerbating the damp issues. There is evidence of previously blocked up window openings from the basement to the void outside. During first visits to the property the basement had a very musky smell indicating mould growth. Since then the builder on site has knocked out 2 or 3 bricks from the former window opening to the lightwell which has had a noticeable positive effect on the smell and damp, although it hasn't cured it.

6.5 The image below is the basement area, the walls had been lined with a compressed woodfibre (hardboard) type product, behind which the walls have been damp and there are signs of what appears to be dry rot mycelium, there were signs of cuboidal decay in some timbers.

6.6 Following removal of the boarding to the ground floor walls around the shop front, to expose the steel beam over the shop front, it was found that the new installed in 2003 was only acting upon the outer leaf of the front wall. The brick walls are generally a 9inch solid wall with random header bricks laid lengthways between the inner and outer leaf to tie the wall together, the inner leaf of the front wall was left supported using a timber beam, which was also taking the load from the part of the first and second floor of the building, and also some of the roof load. The timber beam was bowing under the strain and taking some support from the door frame. The bowing of the timber beam, appears to be allowing the inner brickwork to drop beneath the windows to the first floor and also the stone cills became tilted in the seating. The outer leaf being supported by the steel beam and having the brickwork consolidated with the cement based pebble dashed render was allowing movement within the structure between the two leaves causing cracks in the structure below the cills. The images below are the cracks in the brickwork below the windows on first floor at both corners of the building

6.7 Upon inspection of the existing steel beam above the shop window, it was found that it the beam on one side has been installed bearing on a length of timber, whilst the other end is placed on what appears to be small pieces of engineering bricks placed on a section of timber decaying from rot, the size of the bricks is only providing support to half the width of the beam.

The pictures below are of the ends of the steel beam

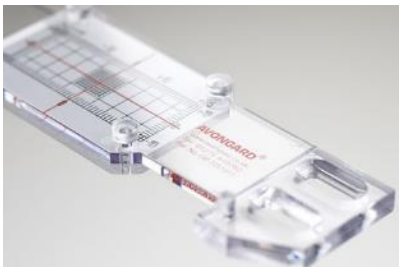
6.8 Coinciding almost the with front face of the neighbouring property is a vertical crack in the brickwork approximately 2.0m back from the front wall of the building on the left (as viewed from the front), extending from the internal ground floor level up to almost the underside of the second floor

6.9 The right hand of the shop (as viewed from the front, currently is fitted with a gas central heating boiler, therefore the condition of the brickwork behind hasn't been determined.

7. CONCLUSION

Whilst the building has undergone some substantial repair work in recent years, it would appear that perhaps more work should have been carried out during that time. The installation of the steel beam over the shop window should have been installed on a solid bearing across the full width of the beam at least.

It cannot be determined from this inspection whether the cracks in the masonry were evident in 2003 when the remedial work was carried out, and if they were whether they have moved since, and the gaps continued to grow. With the benefit of time, there are recognised methods to monitor movement cracks and displacement on masonry and other structures such as fixing a tell tale as the image below and recording the position / gap over period of time. However in this instance it wouldn't be practical or cost effective to leave the structure for any length of time to determine any movement.



The structure is exhibiting signs of structural defect and any movement should be arrested before serious defects occur within the building leading to partial collapse.

8. RECOMMENDATION

8.1 The defective timber beam providing support to the masonry above the shop window inner leaf. The existing beam providing support to the outer leaf should be re-seated on a suitable bearing structure and the defective timbers beneath the beams (and any found in the wall below, to be carefully stripped out and replaced with brickwork on mortar beds, shimmed with slate packing to ensure the beam is fully supported. The defective brickwork in the inner leaf where the inner timber beam has failed is to be rebuilt using reclaimed brickwork and a lime/sand mortar, allowing the first floor window cills to be levelled.

8.2 The front brickwork corners of the building where the shop window jambs occur is very slender with little masonry on the returns (approx. 350mm).

Building regulation would require a minimum of 665mm of brickwork on a corner to the side of a door or window to ensure stability of the corner, unless a steel column is incorporated within the wall, or similar. The slender corner has allowed the wall at right hand (as viewed from the front) to bow out under the load from above. To counteract the effect of weight of the walls, etc from above onto the steel beam(s) which tend to naturally press down and outwards in a sort of ópyramidôfashion, which is resulting in the slender walls being pushed out. It is proposed to build up the masonry to the side of the window to increase the width of the masonry return by approximately 375mm ï equivalent to 1 ½ brick lengths (of those in the building) using engineering bricks, or concrete blockwork laid flat to provide additional support to the steel beams above, and tied into the existing brick structure using stainless steel crocodile ties. The existing brick corners at the side of the window, currently exhibiting cracks in the pebble dash render are to be tied/stitched together to prevent any further movement, before building the additional masonry, to tie the front of the building together at ground and lower half of the first floor, where the walls have bowed. The corners to be stitched using stainless steel helical bars inserted into holes drilled across the corner of the masonry (pebble dashed render removed to facilitate and to cover over following installation of metal stitching). A series of holes at every 4th brick course, through the bricks to be drilled at approx. 45 degrees off centre through the corner of the masonry from the front wall diagonally into the side wall, deep enough to penetrate into the outer leaf, but not too deep to protrude through the other side. Helical stainless steel rods to pushed into the holes into the holes packed with chemical resin grout to bond the brickwork and tie the corner of the building together to prevent further movement.

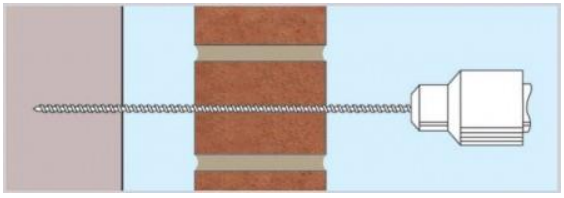
The additional masonry added to widen the piers to the side of the window, together with the metal stitching and ties will ensure the ópyramidôeffect of the weight of the walls, etc bearing down on the ends off the steel beam cannot move the wall outwards any further.

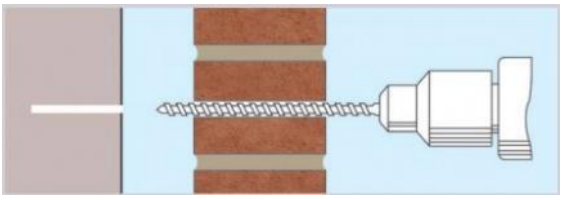
8.3 The defective first floor structure to be stripped out. A new floor structure to be installed tying the front and rear walls shall prevent any movement, providing lateral restraint to the structure at first floor level. A pair of steel beams to be installed at equal third positions, spanning left to right across the building to provide support to new floor joists spanning from front to rear (sizes to suit the span). The steel beam at the front of the building,

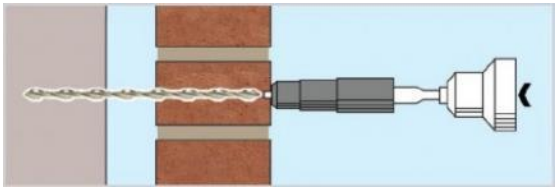
and those at the intermediate positions to be fitted with a timber joist bolted into the webs of the beam with M10 bolts at 450mm ctrs. The new floor joists to be installed on joist hangers fixed to the timber in the web to provide positive restraint. A timber beam fixed to the rear wall using stainless steel threaded bar 10mmØ chemical resin anchored into the rear wall to provide a suitable bearer beam for the joists at the rear section of floor to be supported using joist hangers, in a similar manner as the image below. Solid blocking to be provided between joists longer than 2.5m at the mid span to prevent any twisting of the joists and sideway (lateral) movement.

The new steel beams installed at intermediate positions are to be placed in a pocket in the wall (as the timber joists are) on a dense concrete padstone, bedded and pointed in lime/sand mortar facilitated by the removal of the inner leaf brick in that area, as above photograph.

It is noted that the header (through) bricks within the wall which effectively tie the inner and outer brick leaves together are fairly random. To ensure the load from the floor onto the steel beams does not try to push out the wall in the area due to the ópyramidôeffect of the load, it is proposed to use stainless steel helical bars (approx. 7mmØ x approx. 180mm long) into holes drilled through bricks beneath and either side of the padstone, through the inner leaf and halfway into the outer leaf brick (carefully measured to avoid drilling through) and chemical resin anchored in place to tie, in a similar method the images below from Helifix website.







8.4 To assist further movement from the brickwall at the side of the building at floor level, it is proposed to provide a 100mm RSA (angle iron) beam spanning from the steel beam at the front of the building to the beam at 1/3 distance position bolted or welded inside the web within the floor zone. In a similar method to the ties noted above and the timber bearer beam at the rear wall, drill and resin fix a series of 10mmØ stainless steel threaded bars through the steel and inner brick leaf to halfway through the outer brick leaf, secured in place with the chemical resin before fitting a nut to the threaded bar once cured and tightening in place.

8.5 The ómodernôfloor joists forming the ground floor should be assessed individually for defects and signs of rot, to be replaced with like for like as necessary.

8.6 All timbers within the building (new and existing) to be coated with proprietary timber treatment to prevent against rot. Existing walls to be sterilised with proprietary water based treated to eliminate any dry rot mycelia and prevent any further growth.

8.7 The habitable space proposed in the basement should have mechanical ventilation continually running to provide fresh air and extract the stale air to prevent a build-up of moisture and condensation, which in turn prevents rot recurring.

9.0 INSTALLATION

9.1 Photograph below of the new steel beam installed at the shop front under the inner brickwork leaf, the original steel beam (red) in the background. To the left is the steel RSA (angle iron) welded between the front beam for tying to the brickwork at the side. A concrete pre-cast lintel was put in the front wall to consolidate the wall beneath the window to allow the front wall to be safely supported with acrow jack whilst the new beam was placed in. The timber bolted into the webs of the steel is for the joist hangers to be fixed to, to support the floor joists.

9.2 The image below is of the opposite end of the new beams and is a mirror image of the previous picture. Note the red original beam in the background was installed on an angle to match the leaning brickwork of the external leaf, and the inner leaf has been installed level.

9.3 The image below shows the new timber beam resin bolted to the rear wall in preparation for the new joists to be installed.

9.4 Image below showing the new floor joists fixed on the joist hangers fixed to the timber in the new steel webs