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By Email Only

## Structural Appraisal Report

Existing Rear Boundary Wall to York Street

St Mary's Centre, Church Street,

Clitheroe, BB7 2DG



Prepared for: Mr A. Atkinson  
Atkinson Morley Construction Limited  
8-12 Mill Street  
Padiham  
Lancashire BB12 8EX

7th April 2017



Further to your recent instructions we confirm having carried out a visual structural appraisal of the existing rear boundary retaining wall at the above property and fronting onto York Street in Clitheroe, Lancashire. The inspection was undertaken on 3<sup>rd</sup> April 2017. The weather at the time of the inspection was dry and bright with sunny spells.

## • INTRODUCTION

The brief was to undertake a visual structural appraisal of the existing masonry external boundary retaining wall to the eastern end of the St Mary's Centre site in Clitheroe, Lancashire and report on the general condition of the wall following the noting of leaning and cracking to the external stone face.

The subject wall retains the rear section of higher ground to the St Mary's site, above the external public pavements to Paradise Lane on the south boundary and York Street to the east. The wall runs up to and abuts the central section of the gable end wall of the adjoining property, 11 York Street, on the northern boundary of the rear part of the site.

An existing rear more recent extension building, to the original St Mary's Centre, together with the land extending down to the rear of the boundary retaining wall is currently For Sale.

The report is limited to the external rear boundary retaining wall to the St. Mary's Centre only. No other areas of the St Mary's Centre property were inspected. Exposure and examination of the existing foundations, drains or supporting soils has not been carried out.

The report comments on the condition of the existing external rear boundary wall to the St Mary's Centre at the time of inspection only.

## • DESCRIPTION

The main entrance to the St Mary's Centre is on Church Street in Clitheroe and the existing main building and a more recent rear extension step down across a raised plot towards the rear of the site. The sloping, stepped Paradise Lane bounds the site to the south with a high stone retaining wall to York Street forming the east boundary.

The existing stone faced retaining wall is approximately 470mm thick with a feature, triangular, dressed stone, coping detail extending along the head of the wall over its full length. The external wall face comprises of random sized, riven, stone blocks laid in regular courses to a maximum height of 2.100metres, to underside of coping, above York Street at the south end of the wall, adjacent to Paradise Lane, with the wall stepping down once in height along its length, of approximately 23 metres, but still being approximately 1.900metres high at its north end where it abuts the gable end of the adjoining property No. 11 York Street, due to the sloping down of York Street from south to north.

The existing wall retains ground at the south end of the wall to a height of approximately 2.000metres behind the wall face adjacent to Paradise Lane/York Street. The existing ground levels behind the wall slope down towards the north boundary with the retained height at the north end of the wall being approximately 1.000metres above York Street. At approximately 11.00metres from the south end of the wall at Paradise Lane, an existing mature tree is located immediately behind the rear of the wall. The tree is approximately 1.000metre in diameter and is situated 450mm from the rear face of the retaining wall.

The front elevation of the boundary wall, from the mature tree and extending to the north and the gable end of the adjoining property No.11 York Street, is covered over its full height with creeping ivy vegetation.

- **OBSERVATIONS**

Inspection of the rear boundary retaining wall, front and rear faces was carried out from the existing ground level in front of each wall face.

- **FRONT WALL FACE TO PARADISE LANE/YORK STREET JUNCTION**

Examination of the external front face of the wall elevation was undertaken from ground level in front of the wall. The visual inspection revealed the elevation to comprise of random sized, stone blocks laid in regular courses and block bonded with the riven faced, stone blocks fronting onto York Street. Mortar joints to stones have been patch repaired in the past with differing styles of pointing apparent. Hairline-2mm width vertical/diagonal stepped cracking is evident running up the full height of the wall adjacent to the external corner to York Street. Vertical 1mm-2mm cracking is also apparent to ends of the stepped coping stones to the head of the wall together with several areas of open joints. The wall face to Paradise Lane is plumb with the wall face to York Street leaning outwards at the head approximately 70mm over the height of the wall.

- **FRONT WALL FACE TO YORK STREET**

Examination of the front face of the wall to York Street was undertaken from the existing pavement immediately in front of the wall. The northern half of the wall face is covered over its full height with creeping ivy vegetation with limited inspection only possible. However, visual inspection of the south half of the wall, where the full height of the wall face was visible, revealed the elevation to comprise of random sized, riven faced, stone blocks laid in regular courses, extending up the height of the wall to the stone feature coping detail. The wall face has been repointed previously, but mortar is spalling in several areas with several open joints between stone blocks apparent. To the south end and where the coping steps down in height, at approximately 8.000metres from the south end, the external face leans outwards at the head between 70mm - 80mm over the height of the wall.

At approximately 11.00metres from the south end of the wall an existing mature tree is located immediately behind the retaining wall. Inspection of the wall face in this area, behind the creeping

ivy vegetation, revealed a varying 3mm-5mm wide stepped, vertical, crack running full height of the wall from pavement level up to the underside of the stone coping detail. The crack runs across several stone blocks and in mortar joints. The front wall face is also displaced across the crack line. Further horizontal cracking is also apparent running in stone courses to the head of the wall and extending over several metres towards the north end of the wall. The wall face leans out at the head approximately 80mm over the height of the wall adjacent the crack location.

Inspection of the north end of the wall adjacent to No.11 York Street, where possible through the creeping ivy, revealed more areas of localised spalling to pointing and several open joints to the stonework.

- **REAR WALL FACE TO PARADISE LANE/YORK STREET JUNCTION**

Inspection of the inner face of the wall elevation was undertaken from ground level immediately behind the wall, this revealed the inner face of the boundary wall to comprise of random stonework laid in a random arrangement. The retained ground at the south end of the wall extends to the underside of the feature stone coping at approximately 2.1000metre height. The stone copings are in good condition with hairline cracking to joints between copings running up Paradise Lane over 2.000metres from the south end of the wall.

- **REAR WALL FACE TO YORK STREET**

Examination of the inner face of the boundary wall to this elevation was undertaken from ground level immediately behind the wall. This revealed the inner face of the boundary wall to comprise of random stonework laid in a random arrangement as previously noted. The retained ground at the south end of the wall elevation extends to the underside of the feature stone coping a height of approximately 2.1000metres. The ground behind the wall slopes gradually down towards the north and the exposed inner wall face varies from zero at the south end to approximately 1.000metre at the north end of the wall. The retained height at the north end is also approximately 1.00metre in height. Drainage inspection chambers are evident in the existing footpath set back from the rear of the wall serving the more recent rear extension to the St Mary's Centre.

The northern half of the inner wall face is covered with creeping ivy vegetation with limited inspection only possible. Visual inspection of the south half of the wall was possible and this revealed flush pointing to the random stonework with several small open joints between stones. Joints to the feature stone copings are fully pointed with hairline cracking evident in several areas.

At approximately mid-length of the wall a large mature tree, with a trunk diameter of 1.00metre, is located at 450mm from the inner wall face. The tree trunk is covered in creeping ivy which has spread down the faces of the boundary wall over the northern half of the wall elevation.

- **COMMENT**

From our inspection the defects noted to the rear boundary wall fronting on to York Street include:-

- Vertical/diagonal stepped cracking to external front corner with adjacent Paradise Lane.
- Spalling of previously re-pointed areas of external wall face together with general open/recessed joints.
- Leaning out of the external wall face at the head between 70mm-85mm over the full length of external stonework elevation.
- Hairline cracking to joints in stone copings.
- Stepped vertical and horizontal cracking to external wall face, adjacent to existing mature tree located near to rear face of wall.
- Displacement of wall face across above crack at low level to wall.
- General open/recessed joints to random stonework to rear face of wall.
- Heavy vegetation growth to particularly the north half of wall from creeping ivy vegetation.
- General areas of natural discoloration to external wall face.

It is evident that the rear boundary wall has been subject to a general lack of regular maintenance over its life.

The defects noted particularly the stepped vertical/diagonal cracking adjacent the front external corner and the leaning out of the head of the wall along its length are considered the result of long term ongoing settlement and related distortion of the wall from the retained material behind the wall. No weep holes are evident through the wall and possible increased pressure from consolidation and saturation of the existing fill behind the wall as a result of water percolating through the ground increasing loading behind the wall may be a factor in this movement. The movement has occurred over the life of the property and may be continuing. The leaning out of the wall may have also been aggravated over time by the remodelling of ground levels behind the wall, an existing footpath with drainage evident is in close proximity to the wall and also the presence of the large tree growing immediately behind the central section of the wall.

The defect noted of hairline cracking to joints in stone copings are considered the result of ongoing cyclical shrinkage movements associated with long lengths of masonry wall panels. This movement is a long-term defect that has occurred over the life of the property.

The spalling of previously re-pointed areas and general open/recessed joints across the wall face are the result of poor preparation of the original mortar joints prior to receiving re-pointing together with general weathering effects on the wall face. These are long term defects and have not been properly addressed in the past.

The stepped vertical cracking together with displacement of the wall face across the crack line and noted local to the central section of the retaining wall are considered the result of increased localised lateral forces exerted on the existing wall from the roots of the existing large mature tree located immediately behind the rear face of the retaining wall. This tree has been allowed to grow in a sensitive area relative to the existing retaining wall over a considerable period and the root ball is now affecting the wall stability in this area with the defects noted. The vegetation growth over the wall has resulted in this defect going unnoticed and not having been addressed in the past. Whilst we would conclude that the wall is not in a dangerous condition, at present, if this defect is not addressed in the short term then the ongoing stability of the wall will be affected.

It is difficult to predict when collapse of a wall will occur but it may be sudden and without warning. The current condition of the wall should be addressed in the short term to ensure the wall is safe from collapse and to ensure the safety of the passing public and adjacent highway users.

The heavy vegetation growth to the wall particularly over the northern half of the wall is the result of a general lack of regular maintenance of the wall over a long period. The vegetation growth may affect, in the long term, the stone face and mortar joints of the wall and the dense growth prevents any early identification of any ongoing defects.

The defects noted should be addressed as part of a programme of remedial building maintenance works to the rear boundary area in order to return the external rear boundary wall to a structurally sound condition and ensure the ongoing structural integrity of the wall.

## • **RECOMMENDATIONS**

We recommend the following remedial works be undertaken as part of a programme of building maintenance works to be carried out in the short term, within the next twelve months, to return the external rear elevation to a sound structural condition and ensure the ongoing structural integrity of the boundary.

Repair works to be considered include.

- Cut back and remove the creeping ivy vegetation affecting the full length of the rear boundary wall but particularly the northern half of the wall. Ensure vegetation source is removed from site and new planting of a more appropriate nature is installed as required.
- Consider removal of the existing mature tree located immediately behind the existing rear boundary retaining wall. All removal works to be undertaken following obtaining of all relevant approvals from Local Authority and with tree works to be carried out by an approved tree surgeon. Works are to include for the grubbing out of all tree roots to the area to the rear of the wall.
- In any areas of cracking to the wall, as noted or exposed following removal of the creeping ivy vegetation, repair cracking to external wall face by raking back external wall face at 45° for a minimum of 2.000metres to either side of crack. Re-build wall

using reclaimed stone blocks and replacing any cracked stones with new stone blocks of similar colour and texture as existing.

- In areas of open joints and spalling to previously re-pointed areas consider the re-pointing of the full wall elevation. Rake out mortar joints to a minimum depth of 25mm and re-point using an appropriate strength cement or lime mortar finished to match the original flush pointing do not provide a struck point finish to the stonework as this may cause further ongoing defects to the stonework face.
- With regard to cracks to joints in stone copings rake out any cracks to a depth of 35mm and re-point to match adjacent wall area. Check bedding of coping stones for loose bonding and re-bed any stone copings that are loose or deteriorated along full length of wall.
- Check existing drainage runs in footpath to rear of wall by CCTV inspection for damaged or leaking joints.
- Consider introduction of drainage medium/ strip to rear of retaining wall and face introduce weep holes through face of wall at low level to allow free draining of retained material behind wall.
- Clean down existing masonry wall face on completion removing staining and low level moss growth.
- Consider reduction in height of wall to north end of wall where retained height is less than at south end of wall.

The above is not an exhaustive list but gives an indication of the remedial works required to be carried out to ensure the continued structural integrity of the existing retaining wall.

It should be noted that, even after repair, where a wall has fractured further movement due to moisture and thermal variations may occur at the weak points causing minor cracks. Occasional re-pointing may therefore be required in the long term.

## • EXCLUSIONS

This report is limited to the external rear boundary wall elevation of the St Mary's Centre in York Street, Clitheroe only. No responsibility can be accepted for any other areas of the property or any hidden or latent defects that a more detailed survey may reveal.

This report cannot be communicated to a Third Party or divulged in any way without the written consent of Francis Bradshaw Partnership LLP who is not responsible in any way for conclusions, comment or actions of a Third Party acting on behalf of this report.

Typical photographs taken at the time of the inspection are enclosed for your information.

Yours sincerely

A handwritten signature in black ink that reads "Simon Preugschat". The signature is written in a cursive style with a prominent loop at the end of the last name.

**Simon Preugschat CEng FIStructE**  
**Francis Bradshaw Partnership**  
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**Structural Appraisal Report**

**Existing Rear Boundary Wall to York Street**

**St Mary's Centre, Church Street,**

**Clitheroe, BB7 2DG**

**PHOTOGRAPHS**



**PHOTOGRAPH No. 1:**  
**VIEW ON EXISTING RETAINING WALL LOOKING NORTH ON YORK STREET.**



**PHOTOGRAPH No. 2:**  
**VIEW LOOKING WEST ALONG FACE OF EXISTING STEPPED RETAINING WALL ON PARADISE LANE.**



**PHOTOGRAPH No. 3:**  
**VIEW ON EXISTING RETAINING WALL LOOKING SOUTH ALONG YORK STREET FROM GABLE OF ADJOINING PROPERTY NO.11 YORK STREET.**



**PHOTOGRAPH No. 4:**  
**RAISED RETAINED GROUND LEVEL AND MATURE TREE BEHIND WALL TO YORK STREET.**



**PHOTOGRAPH No. 5:**  
MAXIMUM HEIGHT OF RETAINED GROUND LEVEL BEHIND WALL AT  
SOUTH END ADJACENT PARADISE LANE/YORK STREET JUNCTION.



**PHOTOGRAPH No. 6:**  
MATURE TREE IMMEDIATELY BEHIND EXISTING WALL AT APPROXIMATELY  
MID-POINT OF ELEVATION ON YORK STREET



**PHOTOGRAPH No. 7:**  
VIEW ON REAR OF EXISTING RETAINING WALL TO YORK STREET.



**PHOTOGRAPH No. 8:**  
STEPPED VERTICAL/DIAGONAL HAIRLINE CRACKING TO FACE OF WALL  
AT CORNER OF PARADISE LANE/YORK STREET WITH OPEN MORTAR JOINT.  
NOTE ALSO LEANING OUTWARDS AT HEAD OF WALL FACE TO YORK STREET.



**PHOTOGRAPH No. 9:**  
AREA OF OPEN/RECESSED JOINTS TO STONEMWORK ON EXTERNAL WALL  
FACE ELEVATION TO YORK STREET.



**PHOTOGRAPH No. 10:**  
3MM-5MM WIDE STEPPED VERTICAL CRACK EXTENDING OVER FULL HEIGHT  
OF FRONT WALL FACE IMMEDIATELY IN FRONT OF EXISTING TREE. CRACK  
EXTENDS ACROSS STONE BLOCKS AND WALL IS DISPLACED ACROSS CRACK LINE.



**PHOTOGRAPH No. 11:**  
**VARYING HAIRLINE TO 3MM HORIZONTAL CRACK TO BELOW HEAD OF WALL AT MID SECTION OF WALL ADJACENT EXISTING TREE.**



**PHOTOGRAPH No. 12:**  
**SPALLING OF POINTING TO MORTAR JOINTS OF WALL FACE AT LOW LEVEL ADJACENT GABLE TO NO. 11 YORK STREET.**

