



Structural Assessment
of
Parapet Walls and Copings
at
Victoria Mill
10 Lower Vickers Street
Manchester
M40 7EL

Client Name: Medlock Construction

Our ref: LM31184

Date: 30th March 2021

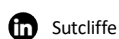
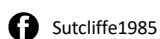
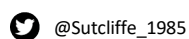
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STRUCTURAL ASSESSMENT REPORT

DOCUMENT VERIFICATION

Report Reference: LM31184

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1.0 Clients Brief

- 1.1 We have been instructed by Medlock Construction to carry out a structural assessment of the parapet walls and stone copings at Victoria Mill, 10 Lower Vickers Street, Manchester, M40 7EL. The purpose of our inspection is to comment upon any significant deterioration to the parapet wall internal elevations i.e facing the flat roof and stone copings above the parapet walls.
- 1.2 A principal object of our inspection was to comment upon the current structural condition of the parapet brickwork and stone copings, making recommendations for rectification works considered necessary.
- 1.3 Inspection of the parapet walls and stone copings was carried out on the 20th March 2021 where the weather was overcast and dry.

2.0 Scope of Report

- 2.1 The contents of this report are strictly confined to comments concerning those terms outlined in the clients brief above.
- 2.2 We have not inspected any parts of the parapet walls or stone copings which are covered, not exposed or inaccessible when viewed from the flat roof and we are therefore unable to comment that any such parts are free from defects.
- 2.3 The views expressed in this report are based entirely upon a visual examination of the parapet walls and stone copings i.e we have not carried out any destructive investigations, exposure works, calculation checks etc carried out from the flat roof.
- 2.4 We have not inspected the parapet wall outer leaf brickwork i.e the external elevations or the external edges of the stone copings. Inspection of the stone copings was hindered at mid-section of the front elevation where scaffold framework extend over the copings and parapet walling.

- 2.5 This report is not intended to be an exhaustive list of minor defects. It is a report commenting upon any significant structural defects apparent in the parapet walls internal elevations and stone copings carried out from the flat roof. Further defects may be uncovered upon more extensive investigations, such as exposure of structural elements, removal of mortar, cutting out bricks.

3.0 Description of Building

- 3.1 For the purpose of this report when using the terms left and right, the building will be referred to as viewed externally from the front i.e. Lower Vickers Street.
- 3.2 Victoria Mill is a typical 19th century cotton spinning mill built in 1869 adjacent to the Rochdale Canal. It is a Grade II* listed building extending to 7 storeys including a basement level. The ground floor has been previously refurbished and fitted-out and is currently occupied by an NHS Department.
- 3.3 The building was built with two wings either side of a circulation core. The southernmost wing and the circulation core have been refurbished under a previous project and this report applies only to the northernmost wing which is the current refurbishment scheme.
- 3.4 The building has solid masonry walls, which are two bricks thick, originally incorporated timber sash windows built into brickwork reveals. The masonry incorporates brick arch heads to the openings with natural stone cills. The original floors consist of brick vaults supported off structural steelwork and were probably over-topped in concrete. The building is finished in a filler joist roof construction overlaid with insulation and a single ply roof covering.
- 3.5 We understand the previous use of the building was as office accommodation prior to acquisition by Signature Living. Following acquisition it was Signature Living's intention to refurbish the building to provide residential accommodation in the form of one and two bed apartments.
- 3.6 Works proceeded on this basis until early 2020 whereupon the site was closed with internal apartments at various levels of completeness as reported herein

4.0 Observations

4.1 Parapet Walls (refer to photographs in Appendix A)

- 4.1.1 External parapet walls project approximately 1400mm above flat roof level constructed in minimum 580mm wide solid brickwork reducing to 460mm wide at mid-height with 575mm wide x 110mm projecting brick piers at approximate 5m centres. The parapets are largely constructed in common brick although there are areas of white facing brick to the front wall and blue stock cant brickwork finishing the wall height reductions and head of the buttressing piers. The height of the parapet walls increase to approximately 2400mm above roof level at the building corners.
- 4.1.2 The internal face of the parapet walls has in the past, been raked out and pointed using sand / cement mortar as opposed to the original black mortar, which appears to be black ash. Areas of this light sand / cement pointing are cracked and falling out through the effects of long term deterioration and weathering where the depth of the pointing noted to be quite shallow e.g 10mm.
- 4.1.3 The deterioration of the sand / cement mortar is most prevalent to the internal face of the front parapet wall and high level parapet walling at the front / left hand corner of the building leaving open mortar bed and perpend joints to both the common brickwork and white facing brickwork. Remedial action is required in this regard.
- 4.1.4 There is early stage plant growth within mortar bed joints in isolated locations across the front parapet wall which requires fully removing i.e ensuring the root is removed, followed by localised repointing of the affected areas. Further there is a blue cant brick missing at the head of the buttressing pier towards the left corner of the front parapet wall which requires reinstatement to match the existing.
- 4.1.5 There are redundant steel straps bolted to the head of the high level parapet wall at the front / left hand corner of the building. Corrosion on the bolts through exposure to the elements has led to expansion of the steel, with these expansive forces transferred into the bricks causing them to split. In addition there are areas of open jointed brickwork where the sand / cement pointing is deteriorating and falling out the joints.

- 4.1.6 There are small areas where the light sand / cement mortar is debonding and falling out the brickwork bed and perpend joints to the left hand elevation parapet walling through the effects of long term weathering with isolated areas of early stage plant growth where self-seeding within the joints. Targeted areas of raking out and repointing is therefore required in this regard.
- 4.1.7 A small section of outer leaf brickwork is missing at the corner of the high level parapet walling at the rear / left hand corner of the building which requires reinstatement using new bricks matching the appearance of the existing. A small piece of stone or concrete is located on the external stone plinth at this location which requires immediate removal where it present a safety risk of falling from above.
- 4.1.8 Pointing to the rear parapet walling was generally noted to be in a reasonable condition with only isolated areas of deterioration of the shallow sand / cement mortar and isolated early stage plant growth. Localised works are considered necessary to this elevation to remove the plant growth and repoint any areas of loose / missing mortar.
- 4.1.9 Pointing to the internal face of the courtyard elevation parapet waling was generally noted to be in a reasonable condition and largely free from noticeable spalling and deterioration.

4.2 Copings (refer to photographs in Appendix A)

- 4.2.1 Copings at the head of the parapet walls across the front elevation, left hand elevation and courtyard elevation are original approximate 1200mm long x 770mm wide x 150mm deep stones which contain scarf joints between stones. We noted the following stones per elevation:-
- a. 35 No full length stone copings across the front elevation parapet walling
 - b. 36 No full length stone copings and 2 No half length stones to the left hand elevation parapet walling
 - c. 20 No full length stone copings and 3 No half stone copings to the courtyard elevation parapet walling

- 4.2.2 Past works have been carried out at this level to point the internal face of the scarf joint between stones and form an approximate 100mm wide x 10mm deep fillet joint between stones upon the surface using sand / cement, we assume carried out at the same time as the parapet wall repointing. Approximate 16mm diameter steel dowel bars were noted through the head of the stone copings located towards the left hand projecting corner we assume fixing the stones into the head of the parapet brickwork.
- 4.2.3 Slight undulations were noted between stone copings consistent with a building of this age most noticeable to the short section of the front parapet walling adjacent to the tower. In addition there are cracks and spalling to the internal edge of the stone copings most common at the joint positions with past repairs / repointing of longstanding origin.
- 4.2.4 There is widespread moss on the top of the stone copings, in particular the left hand and courtyard elevations where the surface of the stones are naturally pitted, retaining rain water within the indentations and providing conditions for moss to grow.
- 4.2.5 We did not however record any evidence of movement of the stone copings when tested by hand or in the form of cracking / disturbance to the sand / cement pointing to the scarf joints and fillets formed between the surface of the stones.
- 4.2.6 Original stones have been replaced with approximate 500mm long x 770mm wide x 150mm deep pre-cast concrete copings above the rear parapet walling, replicating the scarf joint detail of the original stones. This is with the exception of 2 No remaining stones at the abutment of the high level parapet walling at the left / rear corner and initial 4 No pre-cast concrete copings which are 640mm wide. There are 20mm diameter steel dowel bars visible through the head of each coping we assume fixing it to the head of the parapet brickwork. We noted 61 No pre-cast concrete copings across the rear elevation parapet walling.
- 4.2.7 The pre-cast concrete copings were noted to be of reasonable alignment and free from noticeable movement when tested by hand or upon inspection of the mortar between copings. In addition there is no significant moss growth to the surface of these copings where the surface is relatively smooth with falls towards the outer edge.

5.0 Conclusions

- 5.1 In conclusion we consider the external wall parapet brickwork / pointing and copings to the head of the parapets to be in a reasonable structural condition taking into account the age, height and exposed location of the building.
- 5.2 Past works at roof level include repointing the internal face of the parapet walls to the perimeter of the building. This has however been carried out using sand / cement mortar which is not compatible with the more flexible existing black ash mortar whilst the depth of the new mortar was found to be shallow to areas inspected, noted to be 10mm depth.
- 5.3 The effects of long term weathering to the parapet walls are evident in the form of cracking and deterioration of the sand / cement mortar which has de-bonded / is de-bonding and falling out the brickwork joints largely evident to the front elevation parapet wall and high level parapet walling at the front / left hand corner.
- 5.4 We consider remedial action is required to rake out and repoint all areas of mortar deterioration to the parapet walls in addition to raking out and repointing areas where loose mortar is detected upon further close inspection and testing.
- 5.5 Corrosion of embedded steel bolts to redundant steel restraint straps has caused damage to brickwork to the high level parapet walling at the front / left hand corner of the building whilst a small section of outer leaf brickwork is missing to the high level rear / left hand parapet. Localised cutting out of cracked / damaged bricks and reconstruction of the affected area are considered necessary at these locations in addition to reinstatement of any current missing brickwork.
- 5.6 Immediate works are required to remove the stone which is located on the external plinth at the rear / left hand corner where this presents a risk of falling onto persons below.
- 5.7 We did not record any evidence of movement in the copings, either the original stone slabs or the later added pre-cast concrete and therefore we do not consider any stabilisation or remedial works are required in this regard.

6.0 Recommendations

- 6.1 We recommend the following course of action with respect to the parapet walling at roof level (refer to roof plan sketch in Appendix B):-
- a. Inspect and test the condition of the mortar to the inner face of the parapet walls to all elevations
 - b. Rake out and remove any cracked, spalled or loose mortar to a minimum depth of twice the height of the joints and thoroughly clean out joints of all plant, seed growth, dust and debris etc. Thoroughly dampen brickwork and repoint areas of brickwork using good quality mortar
 - c. Cut out split / cracked bricks to the high level parapet walls at the front / left hand corner of the building and bed new good quality bricks and mortar to match the existing
 - d. Reinstate missing outer leaf brickwork to the high level parapet at the rear / left hand corner of the building
 - e. Reinstate all missing cant bricks and parapet wall inner leaf bricks using good quality bricks and mortar to match the existing
- 6.2 The type, size and appearance of the new bricks and mortar should be agreed by the Architect we expect following consultation with Planners given the Listed status of the building.

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- 7.4 We reserve the right to refuse copies of the report to any third party (other than those named previously). We also reserve the right to amend our opinions in the event that additional information is made available at some future date.

Signed: 

B Roberts
IEng AMIStructE IMaPS
Executive Associate

Appendix A – Photographs



Photograph No. 1 – Showing general view of front parapet wall and stop coping scarf joint

Our reference: BR/LM31184

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Photograph No. 2 – Showing joint between coping and 100mm wide x 10mm deep mortar fillet between stones across elevations

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Photograph No. 3 – Showing approx. 100mm wide x 10mm deep sand/cement fillet between stone copings

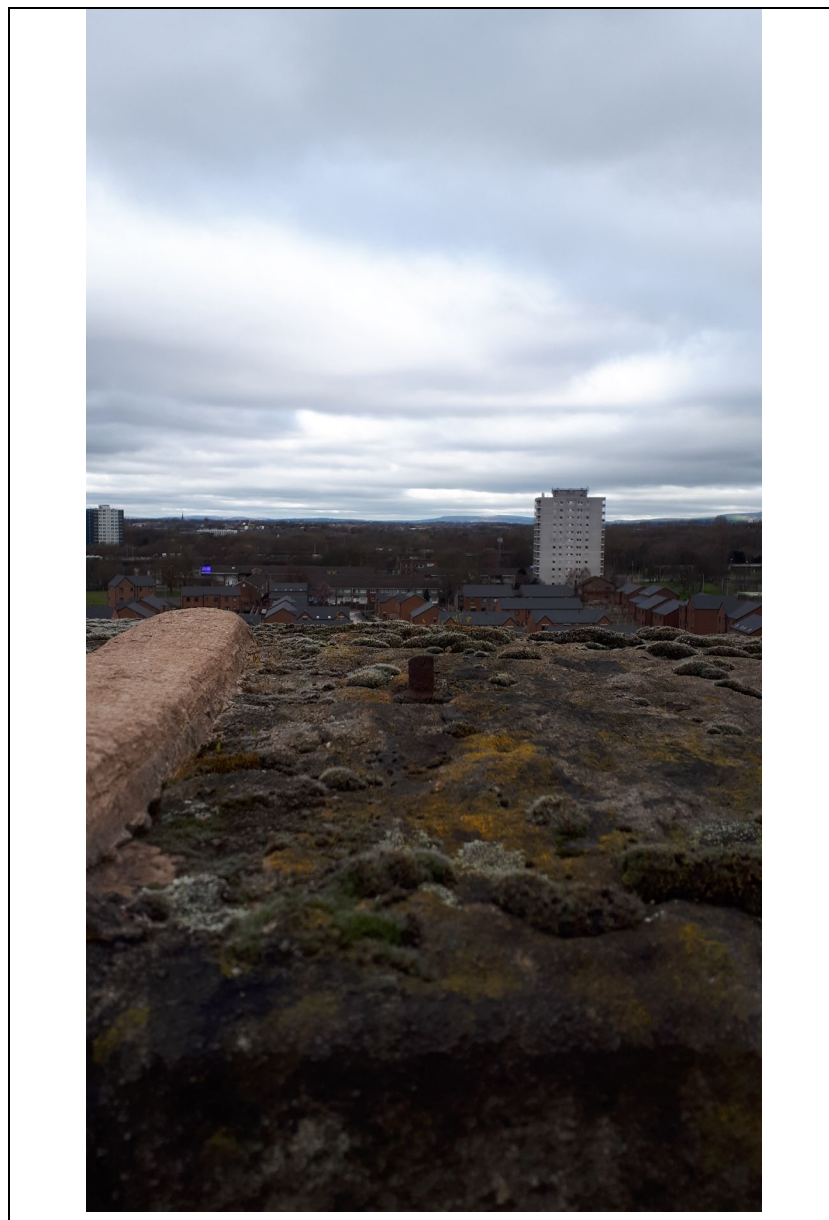
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Photograph No. 4 – Showing steel dowel bar through stone coping to front parapet wall

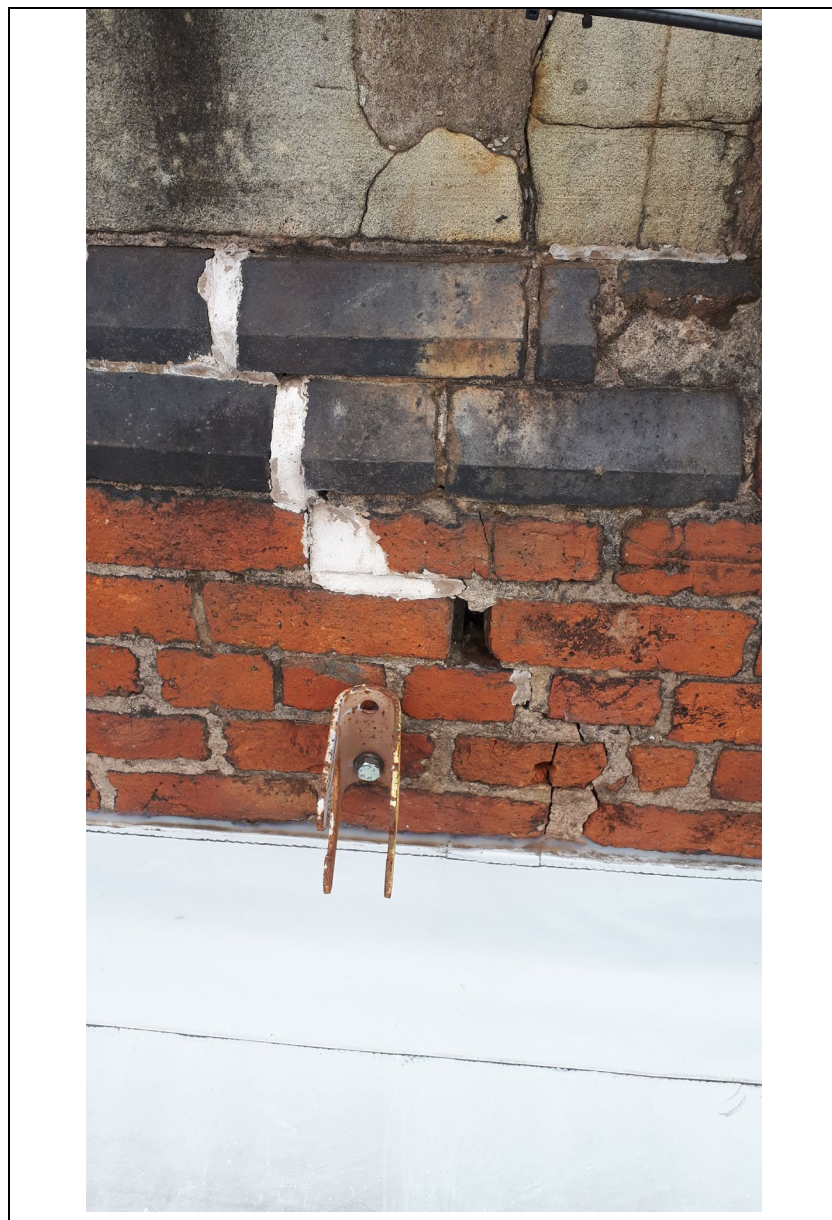
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**Photograph No. 5 – Showing deterioration
past painting to front wall requiring
repointing**

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**Photograph No. 6 – Showing missing cant
brick to front parapet wall pier requiring
reinstatement**

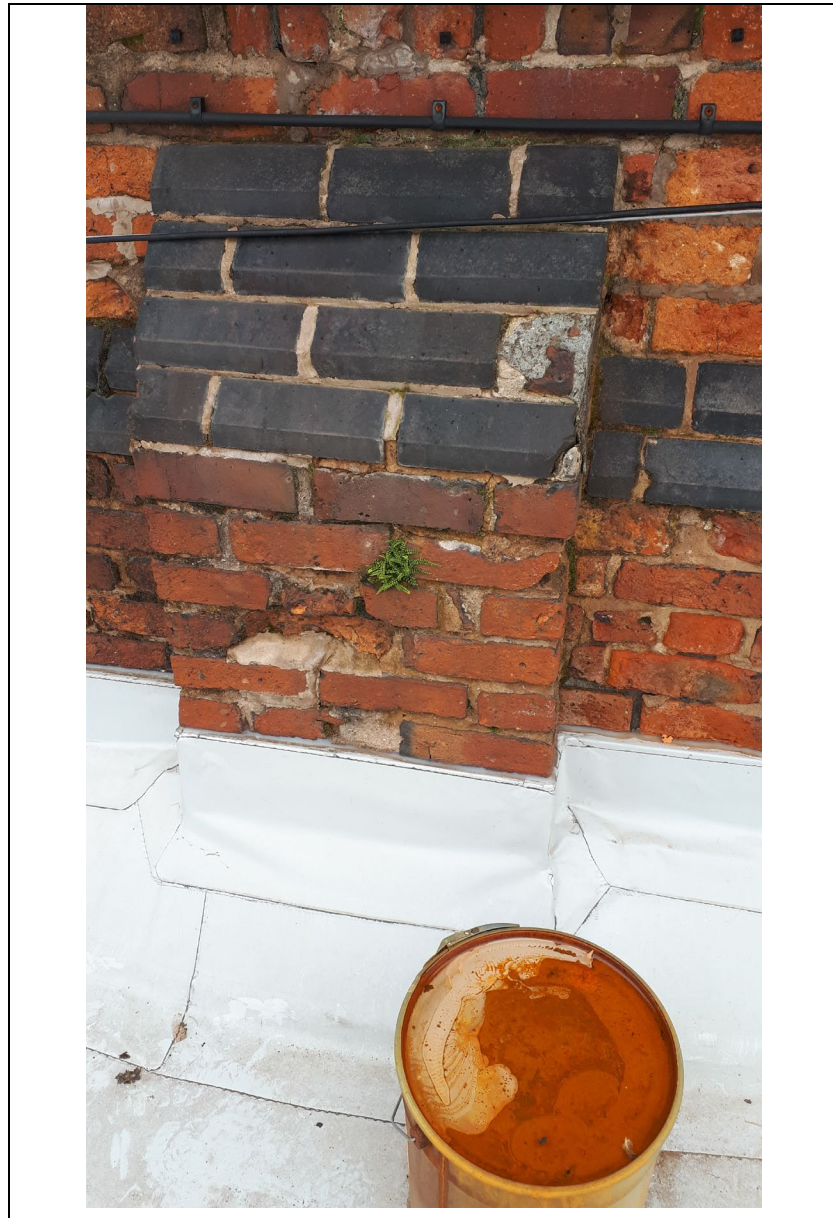
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Photograph No. 7 – Showing spalling to front parapet wall brickwork and early stage plant growth

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Photograph No. 8 – Showing early stage plant growth within joints to front parapet wall

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Photograph No. 9 – Showing steel restraint straps and cracking to brickwork at North East corner requiring removal/repainting

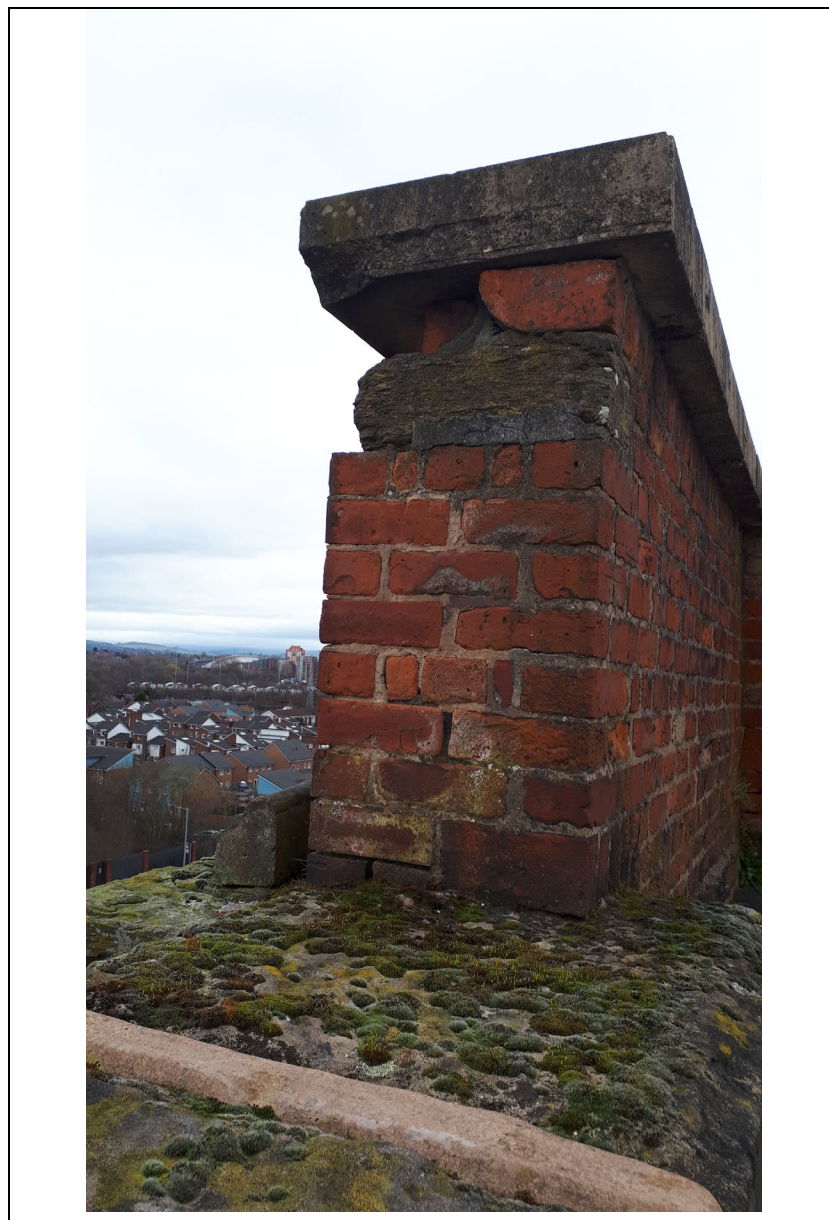
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Photograph No. 10 – Showing missing brickwork to outer leaf at South East corner and stone piece on projecting plinth

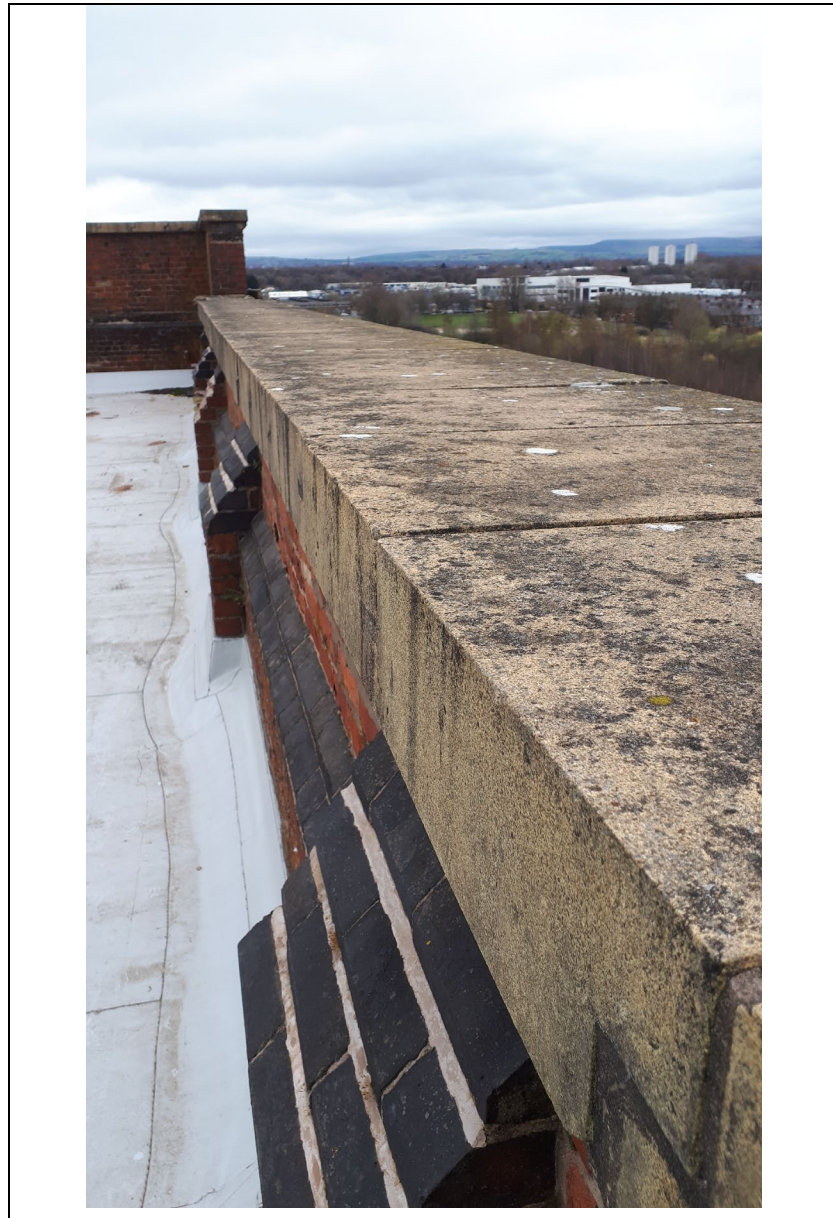
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Photograph No. 11 – Showing recent concrete copings to South elevation (rear) parapet walling

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Photograph No. 12 – Showing steel dowel bolt through concrete coping

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Photograph No. 13 – Showing weathered brickwork to South (rear elevation) parapet wall

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Photograph No. 14 – Showing uneven stone copings to front elevation adjacent to tower

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Appendix B – Roof Plan Sketch

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