

Manchester Art Gallery



Athenaeum Basement [Ref: 141639/JO/2024]
Discharge of Condition 3c, 3d, 5a, 5b & 5c
External Grates & Lintel Repairs
June 2025



Version history

Project name: Manchester Art Gallery
Project number: 9604
Client: Manchester City Council | Manchester Art Gallery

Rev:	Date:	Status	Name	Description
P01	June 25	For discharge of conditions	Hannah Bellerby Senior Architect	First Issue

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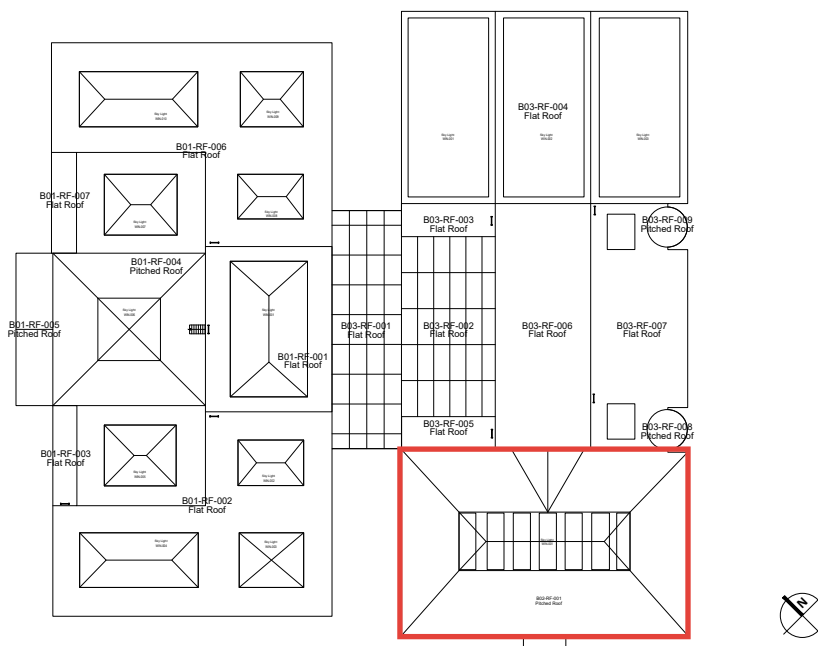
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- 2.0 Condition 3d: Verification report for external grates
- 3.0 Condition 5b: Installation methodology
- 4.0 Condition 5c: Method statement for future maintenance and replacement

Appendix A | Lintel Stabilisation Report

Location Plan



1.0 Condition 3c & 5a: Material sample of window security grille and dry pack mortar

Relevant part(s) of condition:

Condition 3 (c)

Prior to the installation of the external grates hereby approved, a scheme that shall include a material sample pursuant to the details approved under points a) and b) of this condition shall be submitted to and approved in writing by the City Council as Local Planning Authority. The development shall then proceed in accordance with the approved details.

Condition 5 (a)

Prior to the commencement of any works in relation to the implementation of the repair works to the cracked external lintels hereby approved, as shown on drawing no. MAG-BKP-08-B1-DR-S-40-0815 Revision C02 (Received 18/02/2025), the following details shall be submitted to and approved in writing by the City Council as Local Planning Authority:

a. Material samples of the dry plate that shall confirm its overall thickness, height and final finish.

No.	Item	Material and Finish	Photograph	Submitted to	Relevant dates	Comments / Feedback
1	Mock up sample of installed SR4 rated security bars	Grille: Mild steel, PPC finish in RAL 7036 Matt		Michael Pearson [Planning Officer] & Paul Mason [Conservation Officer] Manchester City Council	Window bars installation sample viewed during site meeting on 30/04/25	Sample accepted - agreed for all window bars to be installed with fixings located to the rear face of the bar.
2	Mock up sample of installed SR4 rated security bars with dry pack mortar	Dry pack mortar: Composition: 1 part Portland cement: 3 parts well graded sand. Colour: Buff Height: 10mm				

2.0 Condition 3d: External grates verification report

Relevant part(s) of condition:

Condition 3 (d)

Prior to the first occupation of the development, a verification report that shall confirm the approved works have been implemented shall be submitted to and approved in writing by the City Council as Local Planning Authority.



Figure 1 Photograph showing painted fixing to lower plate



Figure 2 Photograph showing painted fixing to side plates, positioned to rear of bars

Princess Street Grilles [WIN-006 - WIN-013, WIN-022]



WIN-013



WIN-012



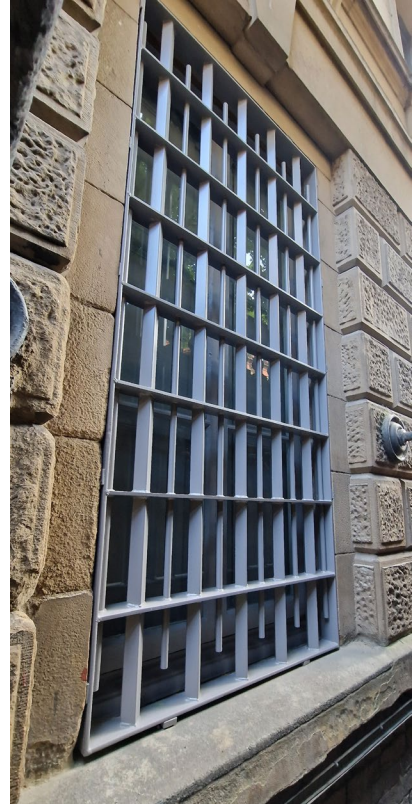
WIN-011



WIN-022



WIN-010



WIN-008



WIN-007



WIN-006

George Street Grilles [WIN-001 - WIN-004, WIN-015]



WIN-015



WIN-004



WIN-003



WIN-002

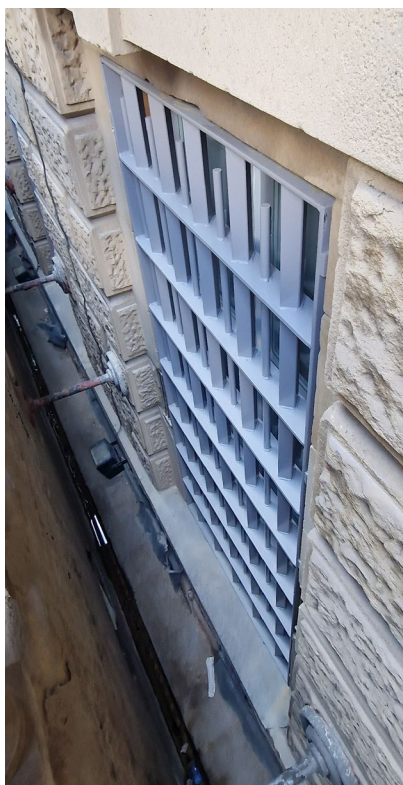


WIN-001

Back George Street Grilles [WIN-014 - WIN-017, WIN-024]



WIN-014



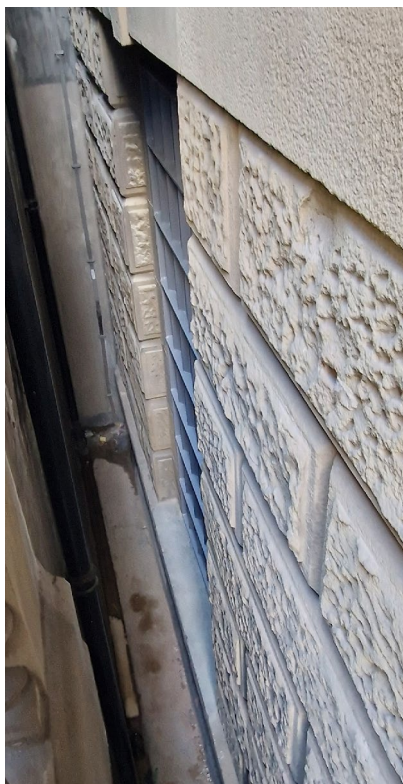
WIN-015



WIN-016



WIN-017



WIN-024

3.0 Condition 5b: Installation methodology

by Warrington Fabrications, Robertson & Buttress

Relevant part(s) of condition:

Condition 5 (b)

Prior to the commencement of any works in relation to the implementation of the repair works to the cracked external lintels hereby approved, as shown on drawing no. MAG-BKP-08-B1-DR-S-40-0815 Revision C02 (Received 18/02/2025), the following details shall be submitted to and approved in writing by the City Council as Local Planning Authority:

b. Installation methodology for the proposed repair works.

Scope of works

The following works apply to windows WIN-004 (George St) and WIN-010 (Princess St) where the new metal security grilles are proposed to stabilise the failed lintels. Further information on the nature of the defects to these lintels can be found in Appendix A, alongside assessment of the proposed stabilisation method in Appendix B.

The installation methodology below references the methodology set out in *Athenaeum Basement [141639.JO.2024]_Discharge of Condition 3a and 3b* submitted and approved under application CDN/24/1195, additional text relating to the lintel stabilisation works is included in **red**.

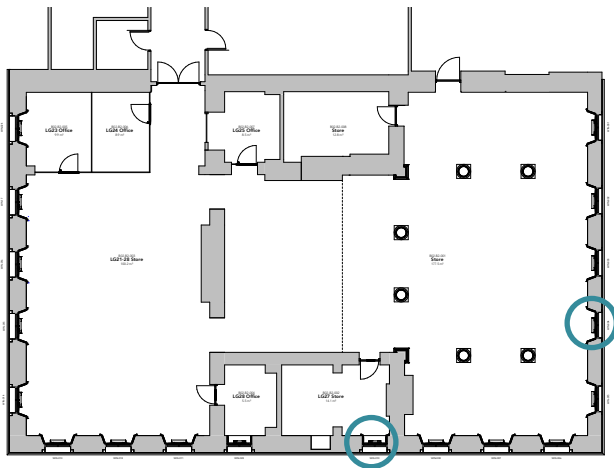


Figure 3 Plan showing location of WIN-004 and WIN-010

Installation methodology

- Prior to commencing work the existing conditions of the window and surrounding stone will be recorded.
- The existing window will be protected with 6mm corrugated sheet "Impact Board" cut to size and placed against the window. This will be loose laid and not fixed to avoid any



Figure 4 WIN-010 with failed lintel highlighted

damage or residue to the windows or stone.

- The existing building and lightwell will also be protected with impact board to a height of 1200mm. This will be held in place using low tack tape.
- The works area is narrow with restricted access. All access equipment will be lightweight aluminium and carried by hand and erected at each window location as the works progress.

- Due to the weight of each security grille they will be craned into position using a floor crane and soft webbing strap. The crane will be a counterbalance floor crane or small spider crane located on the footpath above. All works will be carried out from within the Robertson hoarding.
- The grille will be lowered into the lightwell and guided into position by the installation operative.
- The grille will be packed up, lined and levelled and the fixing holes marked on the stone surround.
- The grille will then be hoisted out of the lightwell to allow the fixing holes to be drilled.
- Fixings are to be made into the stone reveals at no more than 600mm centres in each vertical face and, where the existing head and cill details allow, at least 2 in each horizontal face. All fixings are to be 10mm dia. anti-theft countersunk security bolt fixings.
- The fixing hole of 10mm will be cut using a diamond core bit to reduce the percussive impact on the existing stone to reduce the risk of damage or breakage of the stone.
- If there are any indications of cracking or breakage to stone beginning to occur works will cease and investigated with a remediation strategy agreed with Planning and Conservation before the grille is installed.
- The hole will be cleared of dust & debris using a vacuum hose. The cill and surrounding stone will be brushed down with a soft hand held brush and the dust / debris removed by vacuum cleaner.
- The temporary protection to the window will also now be removed.
- Once all holes are drilled and the area cleared of dust and debris the grille will be lowered back into position and lined and levelled.
- The fixings to the vertical and bottom edges will be installed and tightened and the lifting strap removed.

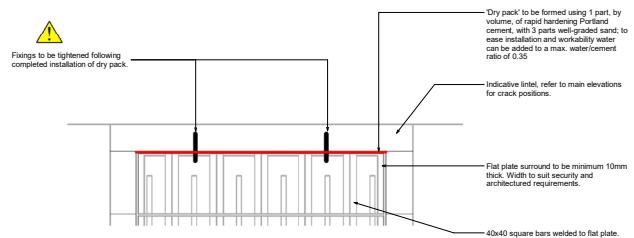


Figure 5 Lintel detail [source: Booth King]

- The 'dry pack' mortar consisting of the following mix:
1 part, by volume, rapid hardening Portland cement, with 3 parts well-graded sand
is to be introduced into the gap between the top of the grille and the stonework reveal and compressed with a pointing iron to the full depth of the grille.
- To ease installation and workability water may be added to a max. water/cement ratio of 0.35.
- Any surplus material is to be cleaned off the face of the stonework and/or grille.
- The fixings to the top edge are to be installed and tightened in place following completed installation of dry pack.

4.0 Condition 5c: Method statement for future maintenance and replacement

Relevant part(s) of condition:

Condition 5 (c)

Prior to the commencement of any works in relation to the implementation of the repair works to the cracked external lintels hereby approved, as shown on drawing no. MAG-BKP-08-B1-DR-S-40-0815 Revision C02 (Received 18/02/2025), the following details shall be submitted to and approved in writing by the City Council as Local Planning Authority:

c. A method statement detailing the future maintenance and replacement, if required, of the metal grates that will support the cracked lintels

4.1 Future maintenance

The proposed grilles to WIN-004 and WIN-010 may need occasional maintenance access. Maintenance requirements will include regular activities such as cleaning of the grilles, and more infrequent activities such as repairs to the finish and repointing (of the dry pack mortar).

Proposed maintenance access to Windows WIN-004 and WIN-010:

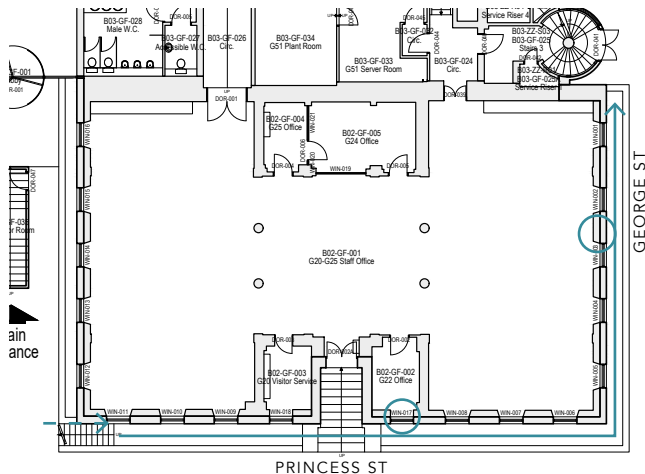


Figure 6 Lightwell access

The Princess Street and George Street lightwells can be accessed via the (gated) steps adjacent to the Back George Street entrance.

The lightwells are narrow (Princess Street ~1000mm wide, George Street ~750mm wide) with restricted access. To access the windows at high level a lightweight aluminium access platform should be utilised.

4.2 Removal / Replacement

The proposed strategy for the defective lintels is to stabilise them in position via the new window security grilles, rather than implementing a permanent repair which would involve significant and intrusive temporary works. Should it become necessary at any point in the future to remove or replace the proposed grilles, the below sets out a suitable methodology.

Proposed method statement for removal/ replacement of grilles to Windows WIN-004 and WIN-010:

- Apply protection as required to the window surrounds and lightwell walls with impact board as detailed in section 2.0. Push cushioning material through the gaps in the grille to provide protection to the window glazing.
- Rake-out dry pack mortar between top of grille and masonry reveal to full depth of grille using a fine-toothed saw blade or hooked knife, or power tool that uses oscillating blades (Fein saw type). Under no circumstances should mechanical tools be permitted (disc cutters etc.).
- Due to the weight of the grilles they should be craned out of the lightwell using a floor crane and soft webbing strap. The crane will be a counterbalance floor crane or small spider crane located on the footpath above.
- Install lifting strap to grille and engage with floor crane. Carefully remove security fixings to top, sides, and then bottom edges of the grille and remove from reveal and lift out of lightwell.
- If the grilles are not to be reinstated, infill fixing points in masonry with suitable lime mortar repair consisting of hydraulic lime and stone dust. The mix should be adjusted to ensure that, when dry, the mortar matches the existing stone in colour and texture. The mortar mix should be softer than the stone to avoid future damage.

Appendix A | Lintel Stabilisation Report

by Booth King

Manchester Art Gallery – Athenaeum Lintels

Consultant Advice Note



boothking

Doc. Ref.	MAG-BKP-08-B1-CA-S-0005	Client	Robertson Construction NW
BKPL Project Number	14794	Current Revision	C02

Rev.	Prepared by	Checked by	Approved by	Stage	Status	Date	Rev description
P01	RMS	DMus	RMS	4	S3	02/12/2024	First Issue
C01	RMS	DMus	RMS	4	S4	25/02/2025	Updated to include lintel stabilisation option
C02	RMS	DMus	RMS	4	S4	13/03/2025	Updated recommendation section to include reference to BKPL drawing.

This document uses revision codes in accordance with ISO EN 19650:

P: Preliminary (non-contractual) - review, comment or approval.

C: Contractual - Approved for stage completion.

This document uses status codes in accordance with ISO EN 19650:

Work in progress

S0: WIP

Shared (non-contractual)

S1: Coordination

S2: Information

S3: Review

S4 & S5: Approval

Published (contractual)

A1, An, etc. (where "n" relates to the project stage)

This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:

2: Concept

3: Coordination

4: Technical Design

4.5 Production Design

5: Construction

6: Handover

Introduction:

Development Proposals

BKPL have been appointed, from a civil and structural engineering viewpoint, to oversee the refurbishment works of the Listed building, Manchester Art Gallery. There are various tasks to complete across the whole project and the development proposals related to this calculation package refer to Work Package 8. Work Package 8 encompasses alteration works relating to the 'Athenaeum'.

Scope

As part of WP14, BKPL assessed the external condition of the façade. Two areas of concern were noted that needed to be remedied in the short-term, and have been brought into WP08 as they have the potential to impact the works. The issue is described in report "*MAG-BKP-14-ZZ-TN-S-0003 - WP14 Lintel Defect Report*". Two external leaf lintels have failed historically and present a safety risk to workers during the refurbishment, and users of the space in future. At the time of writing the original report, the intention was to replace the lintels.

This report presents two possible routes to stabilising the situation:

- 1) One option is to replace the lintel entirely, so the first part of the report presents the structural calculations describing the design loading for a specialist Temporary Works Designer to design a suitable system to facilitate the replacement. At the outset we note this is a disruptively significant piece of work to facilitate.
- 2) The second option is to stabilise the lintel in its current position. There would be several ways to achieve this with the ethos set out in "*BS 7913:2013 The Conservation of Historic Building*". In this project the windows around the Athenaeum are being improved from a security perspective, with substantial steel grilles being fabricated to provide SR4 rated security.

Option 1 – Lintel Replacement Load Takedown

George Street elevation

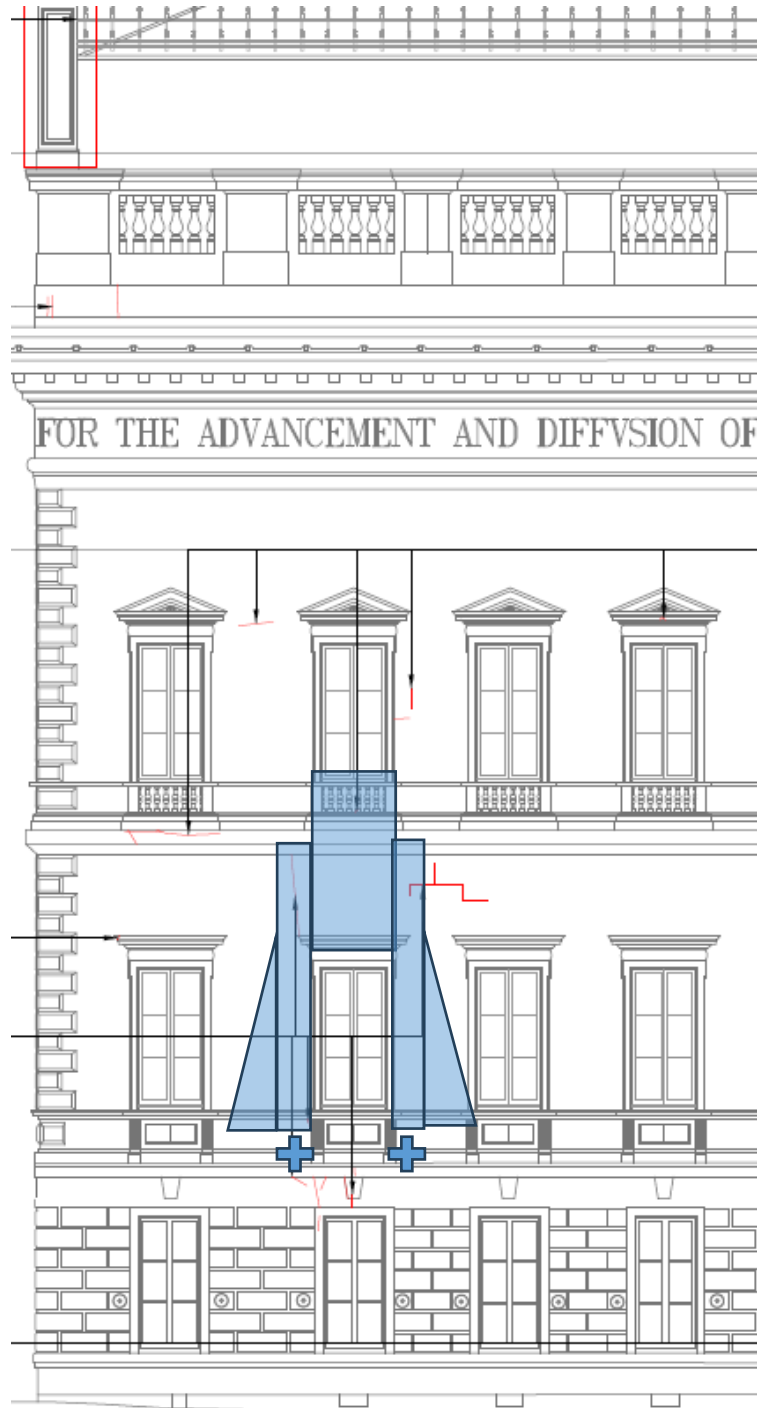


Figure 1 - Loaded area to be supported by TW

Outer Leaf thickness taken as 250mm, based on site assessment. Due to historic movement, corbelling has been assessed to be occurring.

Shaded area = 18.5m^2 . Based on sandstone density 25kN/m^3 , **load to each prop position is 57kN (SLS).**

Princess Street Elevation

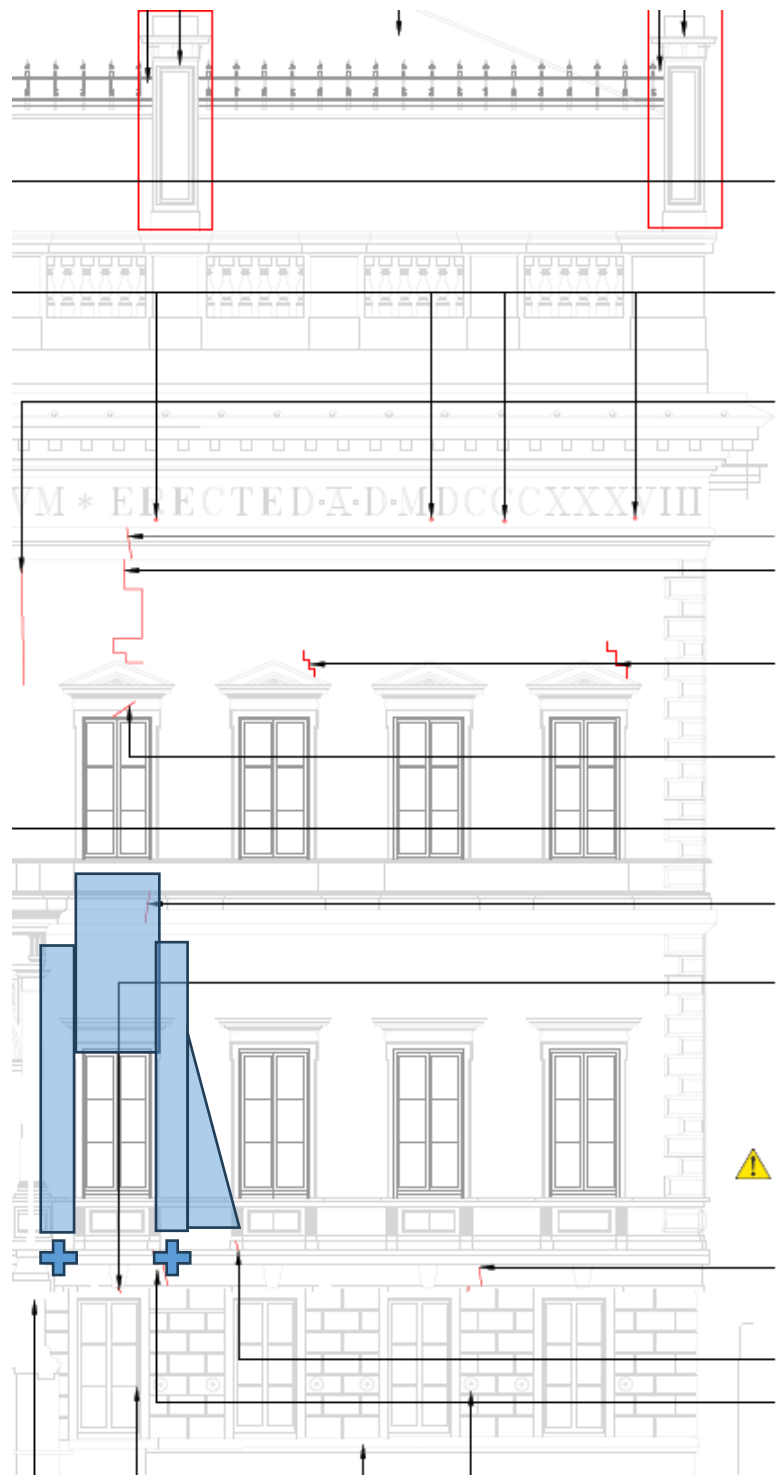


Figure 2 - Loaded area to be supported by TW

Outer Leaf thickness taken as 250mm, based on site assessment.

Due to historic movement, corbelling assessed to be occurring.

Shaded area = 14m^2 . Based on sandstone density 25kN/m^3 , **load to each prop position is 45kN (SLS).**

Option 2 – Lintel stabilization

Architectural / Security Proposal

The steel grille is proposed to be positioned directly under the lintel to form the security barrier. As described in previous reports, the lintel is supported by the window frame, so the intention is to replicate this and support with the security grille, as it is much more robust.

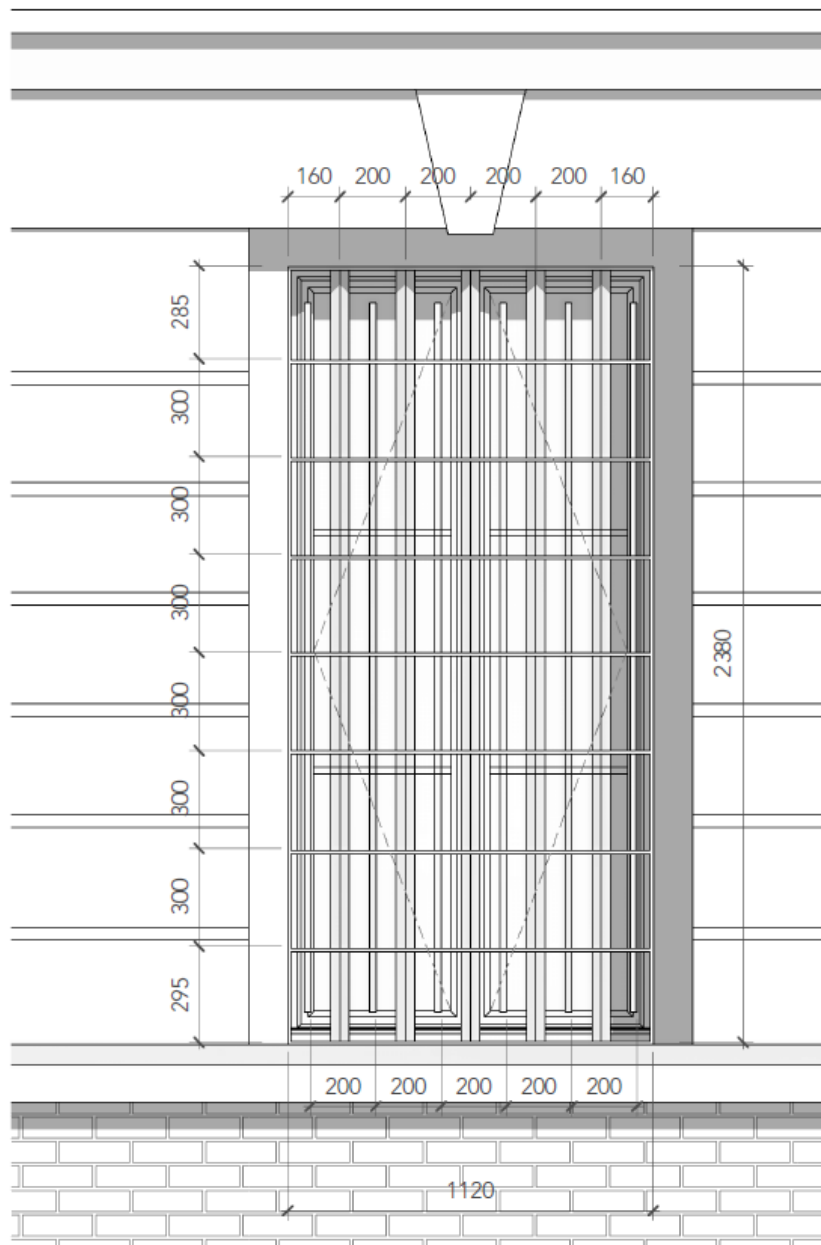


Figure 3 - Extract from Architectural Drawing - MAG-BUT-08-B2-DR-A-31-0001

Security Grille Capacity Check

The grille has been checked under a vertical load equivalent to the full stone area above the lintel being supported. This is conservative but ensures there is sufficient capacity in the grilles to continue to undertake their primary function.

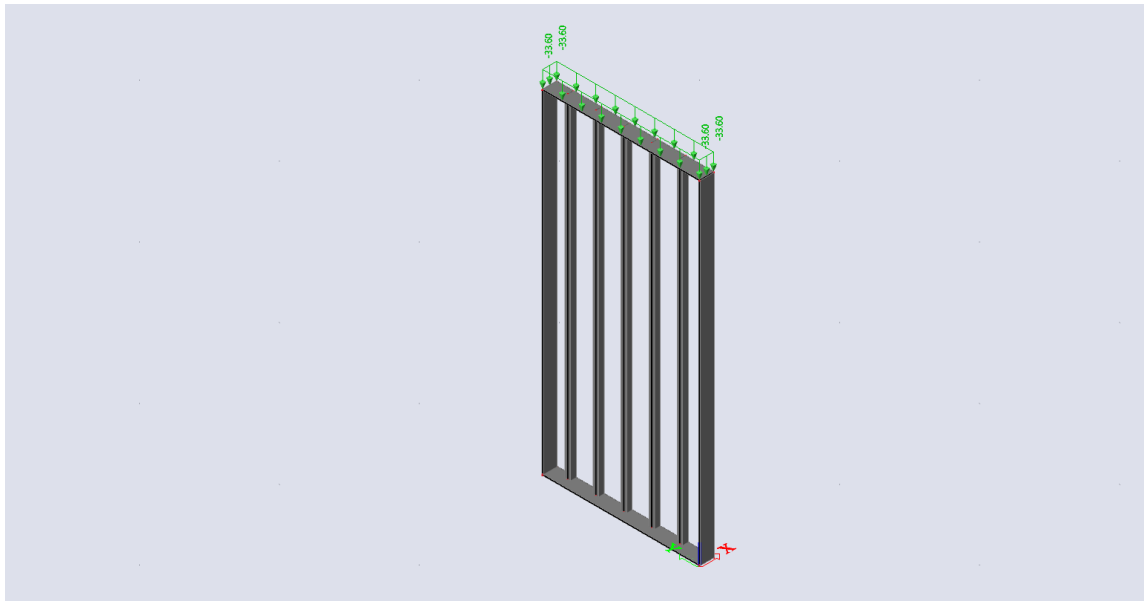


Figure 4 - Applied Load to grille

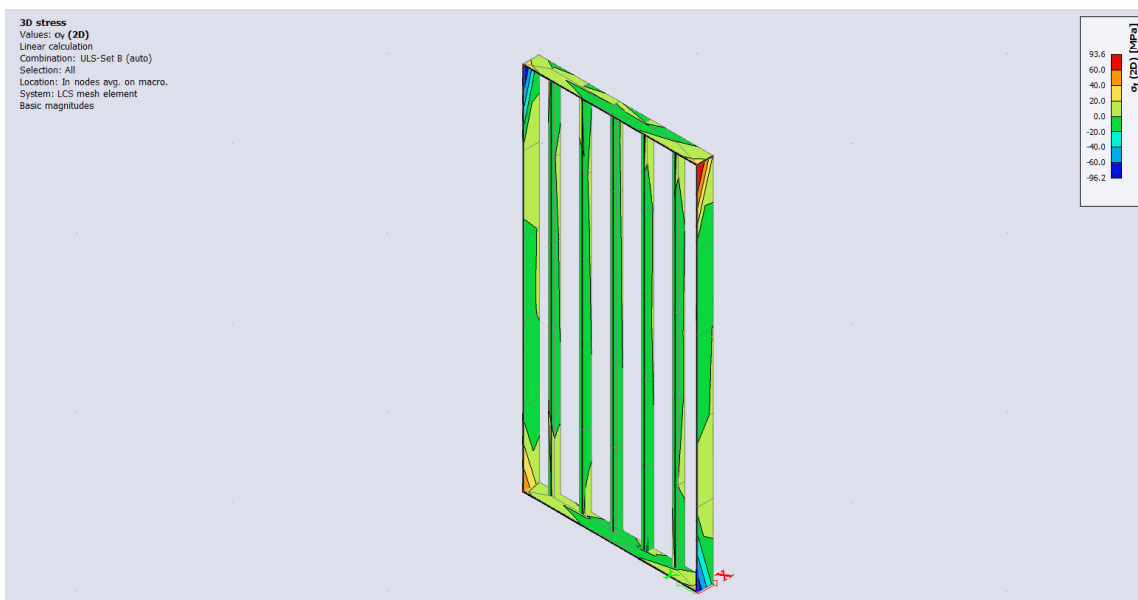


Figure 5 - Maximum Stress under Load

The peak stress is less than 100MPa, which is much less than the capacity of the proposed plates. This is under a conservatively high load.

Deflection is negligible due to the regular nature of the vertical bars.

Recommendation

Due to the costs and complexity of full replacement, it is recommended to proceed with a long-term stabilisation method (i.e. option 2). This is in line with conservation approaches, and reduces the amount of work required to be undertaken to the Listed fabric to a minimum.

Refer to BKPL drawing *MAG-BKP-08-B1-DR-S-40-0815 – WP08 Window Lintel Remedial Details*.

At some point in the future, it may be warranted to undertake the full replacement, however, this should be assessed, in say 10-15 years, to review if any further movement has occurred.

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