

Our Ref: 1826-01
20th February 2024
Client:
Greg Cawley
Senior Project Manager
AtkinsRéalis
The Exchange, 3 New York Street
Manchester
M1 4HN

Poland Street Zone – Ancoats Green – Boundary Wall Inspection Summary Report

0: Introduction

Civic Engineers Ltd are appointed by Manchester City Council (MCC) for the redevelopment project Ancoats Green, located off Prussia Walkway, Jersey Green and public realm land off Jersey Street, Ancoats, Manchester. On the 30th January 2024 the project manager (Greg Cawley – AtkinsRéalis) requested that we undertake a visual condition inspection of the site boundary wall (see figure 1) situated to the southern boundary of the site.



Figure 1 – Site Location Plan

1.0.: Limitations of Survey

Civic Engineers visited the site on the 8th of February 2024, to conduct a non-intrusive inspection of the boundary wall. During the site visit, access was only possible from the site side and no inspection was undertaken from the opposite site. The rear face of the boundary wall has therefore not been inspected and its condition is unknown.

The condition of the wall was assessed via visual inspection only and no intrusive investigation or monitoring has been undertaken to date.

2.0: Desktop study observations

Photographs of the boundary wall provided by the main contractor indicate that the wall was not originally constructed as a freestanding wall. Prior to visiting the site, a review of the phase 1 geo-environmental report was undertaken to establish an understanding of the historic development of the site, this review proved to be inconclusive.

An additional review of google maps image capture history, documents that between Jul 2008 and Sept 2012 a warehouse building, constructed in solid brickwork was demolished at the site, and it appears probable that the boundary wall is the remnants of the demolished building indicated in figure 2.



Figure 2 – Google maps image capture – Jul 2008



Figure 3 – Google maps image capture – Sept 2012

All freestanding masonry walls must be self-stable under wind loads and when assessing the lateral stability capacity of any masonry wall, the head restraint condition impacts the capacity of the wall considerably, for purposes of context it is pointed out that using published guidance "BRE Good Building Guide GBF 14 building simple plan brick or blockwork freestanding walls" a newly constructed boundary wall using one & half bricks thick construction would be considered stable up to a maximum height of 2.50m, providing certain conditions are not applicable, such as site exposure conditions or usage situation for example a "public right of way where there is risk of crowd pressure or of children playing around a wall. In addition, an adequate foundation is designed and constructed to suit the ground conditions.

Any freestanding wall outside of standard rule of thumb guidelines would require a structural engineered solution where design modifications such as increased wall thickness, bed joint reinforcement, or enhanced lateral support via secondary supports or integral pier constructions or a combination of solutions would allow a wall to be safely constructed to suit the nonstandard condition or situation.

It's assumed that the boundary wall will have had an adequate head restraint, via the connection to the roof structure prior to the demolition works which in effect converted the wall into a freestanding wall – i.e. a wall with no head restraint.

A further observation noted in the original photographs was the height of the wall which by simply counting of the brickwork course can be estimated to be approximately 4.10m high.

In summary, the wall does not appear to have been designed or constructed, to suit a freestanding wall situation and in fact the existing height is significantly beyond the limitations of a standard freestanding boundary wall construction.

3.0: Site Observation Commentary

This section of the report documents the areas of defect and deterioration observed during the site inspection. To manage the documentation of the survey the wall has been subdivided into panels and denoted as per figure 4.

Each panel has been assessed against a checklist of recurring defects across the wall, observed during the site visit, and detailed and denoted within appendix A. A summary commentary is provided below to discuss the nature, cause and impact of the defects observed.

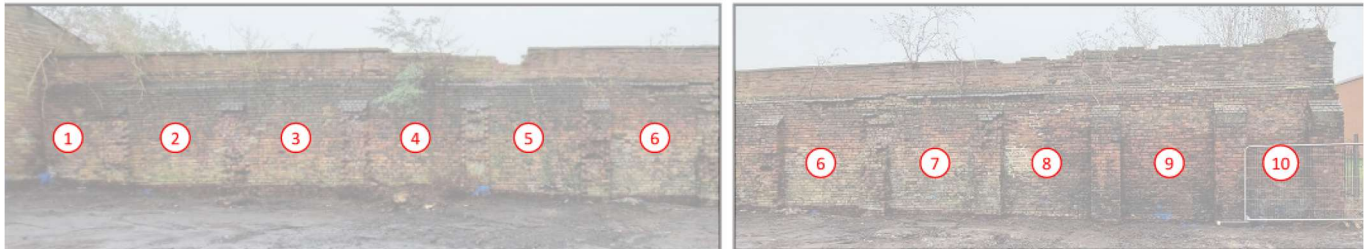


Figure 4 – Photograph of wall denoted with panel references.

3.1 – Condition Issues

The following is a description of the condition issues observed which are considered likely a result of lack of maintenance and will be adversely affecting the walls stability capacity. Should the condition issues noted be left to continue to deteriorate, the capacity of the wall will be further adversely impacted.

Significant areas of mortar deterioration were observed in each of the wall panel 1 to 9, and generally the severity of issue increased in extent and depth of mortar loss towards the northeastern side of the wall.

Surface spalling of the brickwork was evident in most areas of the wall and again was generally more severe to the northeastern side of the wall. Although typically spalling of the wall will only presents cosmetic issues, as the severity increases so too does the likelihood of structural issues arising due to the deteriorating condition.

The wall has large areas of vegetation growth within the mortar bed, and in some instances, this has resulting in larger planting taking effect in the wall, (see panels 4, 6, 7 and 8) Where the large planting has occurred it is evident that structural issues have arisen immediately adjacent due to the resulting adverse stresses within the wall.

3.2 Structural Defects

A partial collapse of the wall has occurred in panels 4, 5, 8 and 10, and this is accompanied by adjacent structural cracking and loosening of the brickwork panel, further weakening the masonry construction increasing the likelihood of further collapse.

A section of stretcher courses, (3No.) have locally broken away from panels 6 to 8 revealing the inner snapped header coursing. Adjacent to this section of wall further failure of the neighbouring brickwork can be seen such as loosened and missing brick sections, this results in local weakening of the masonry construction and increasing the likelihood of further local collapse.

As discussed above structural cracking has occurred in panel 3, 4, 5, 6, 7 & 8. The more obvious structural cracking has occurred in the top section of the wall where the wall thickness appears to

reduce to 1 brick thick. The primary cause of the structural cracking is assumed to be associated with the vegetation discussed in section 3.1, and cracking observed appears to be affecting the plumbness of these sections of the wall and can be seen to be leading to potential for further local collapse of the wall, as the wall further deteriorates or whilst subjected to periods of inclement weather.

The ad-hoc removal of the support pier thickenings to the masonry walls has occurred in panels 1 to 8, it is not clear from inspecting whether this has been done intentionally during the building demolition or is a result of deterioration either prior to the demolition works or subsequently during the ensuing period since the completion of the demolition works.

The impact of removing the pier is to significantly reduce the lateral stability of the wall and therefore it is not obvious why this would be done intentionally and is assumed that this is a structural deterioration of the wall, reducing the capacity of the wall to withstand periods of high wind loading.

4.0 Conclusions and Recommendations

In the first instance by undertaking an initial desktop study of the wall, it is concluded that the boundary wall was likely not designed or constructed to be used in a free-standing capacity and based on a review of its current form in this regard, it is in Civic Engineers opinion, that the wall will not be fit for purpose on completion of the construction works, owing to the walls height, lack of structural enhancement (i.e. additional lateral support) and intended usage for the site.

In addition to the above, a visual inspection of the wall, showed obvious signs of significant defects and previous instances where the wall has collapse locally, the wall in its current state presents an obvious danger to both construction operatives and the public on completion of the project works.

Taking account of the above conclusions, the following is proposed as potential mitigation options for dealing with the existing boundary wall. Option 2 and 3 will be subject to completion of a visual inspection to the rear face of the boundary wall.

Option 1- Demolish Wall

The completed solution for the existing boundary wall will be its full removal, although this is understood to be scheduled during a later phase of the wider masterplan. If this is the preferred solution, owing to the poor state of the wall it may be beneficial to undertake these works immediately so as not to waste resources on a temporary fix that will only have limited success in mitigating the risk of future wall failures.

Option 2 -Temporary Remediation

Should it not be possible to expediate the demolition works to the wall, it is considered imperative that a program of remediation works be undertaken to mitigate the risk of further collapse to the wall, both during the construction works and for an indeterminate period immediately after completion of this phase of the project.

A full programme of remediation works can be developed following review of this report, but as a brief description of the works it is considered the following would be required as a minimum.

- Reduce the height of the wall (as a minimum to the top of the pier sections)
- Remove Vegetation
- Patch repair areas of Mortar Deterioration
- Replace sections of missing masonry.

On completion of the temporary remediation works, it should be appreciated that whilst reducing the risk of collapse, the works will not necessarily bring the wall into a compliant status with any design standard or regulation, and that additionally measures are advised to limit the risk to the construction workers and public (on completion of works), via the introduction of an 'exclusion zone' including a physical barrier within the design proposals.

Option 3 - Permanent Restoration

As an alternative to option 2, a series permanent restoration works could also be developed, which would entail similar works to those proposed in option 2 but would also include the following.

- Reinstatement of intermediate additional lateral support via reconstruction of the masonry piers or incorporation of a steelwork support posts.
- Review of the existing foundation / and potential underpinning works

A full programme of restoration works can be developed following review of this report; however, this would be subject to further intrusive surveys to confirm the following.

- Survey to confirm level, plumbness of wall, etc
- Wall Thickness
- Compressive Strength of Masonry and Mortar
- Review of Existing Footing / and founding strata

If you have any queries, or require any further information, please do not hesitate to contact us.

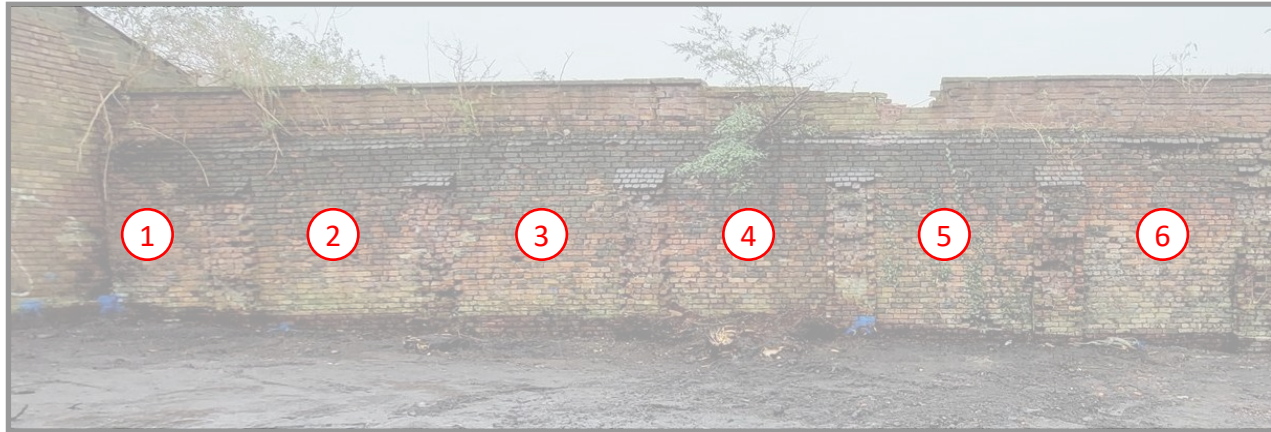
Yours sincerely,



Paul Layton CEng MStructE

Associate

For Civic Engineers



KEY PLAN ELEVATION



Panel 1: Wall Defect / Deterioration Checklist

Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	2
Missing bricks	⚠	-
Local Wall Collapse	-	-
Loose Brickwork	⚠	2
Wall Settlement	⚠	1
Structural Cracking	-	-
Surface Spalling	⚠	2
Pier Support Removed	⚠	3
Vegetation	⚠	2

Panel 2: Wall Defect / Deterioration Checklist

Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	2
Missing bricks	⚠	2
Local Wall Collapse	-	-
Loose Brickwork	⚠	2
Wall Settlement	-	-
Structural Cracking	-	-
Surface Spalling	⚠	1
Pier Support Removed	⚠	3
Vegetation	⚠	2

Panel 3: Wall Defect / Deterioration Checklist

Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	2
Missing bricks	⚠	2
Local Wall Collapse	-	-
Loose Brickwork	⚠	2
Wall Settlement	-	-
Structural Cracking	⚠	2
Surface Spalling	⚠	1
Pier Support Removed	⚠	3
Vegetation	⚠	2

Extent of Damage	
1	Moderate
2	Severe
3	Very Severe



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Panel 4: Wall Defect / Deterioration Checklist

Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	2
Missing bricks	⚠	2
Local Wall Collapse	⚠	3
Loose Brickwork	⚠	3
Wall Settlement	-	-
Structural Cracking	-	-
Surface Spalling	⚠	1
Pier Support Removed	⚠	3
Vegetation	⚠	3

Panel 5: Wall Defect / Deterioration Checklist

Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	2
Missing bricks	⚠	2
Local Wall Collapse	⚠	3
Loose Brickwork	⚠	3
Wall Settlement	-	-
Structural Cracking	⚠	3
Surface Spalling	⚠	2
Pier Support Removed	⚠	3
Vegetation	⚠	1

Panel 6: Wall Defect / Deterioration Checklist

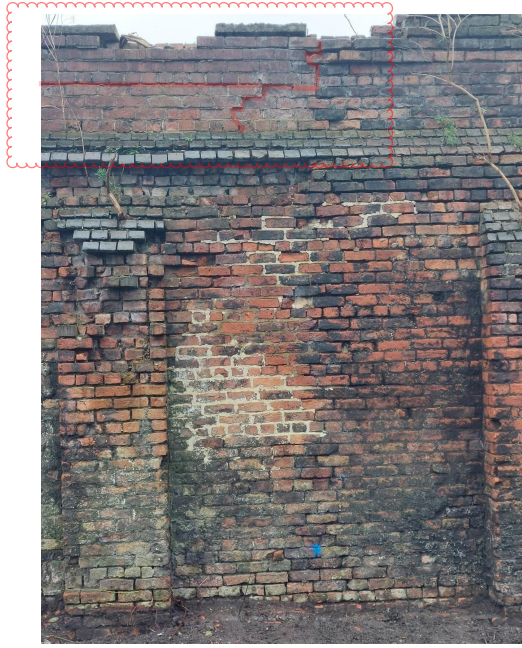
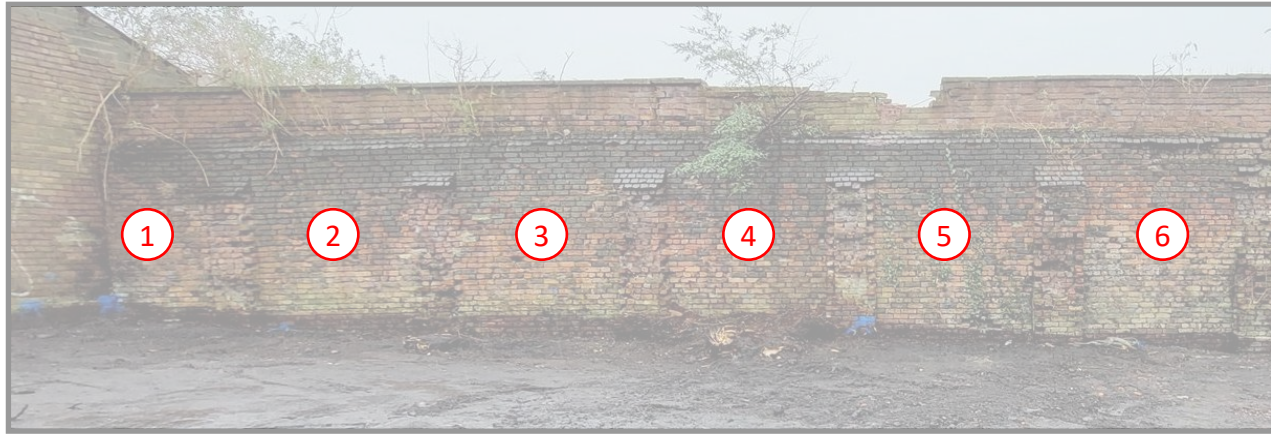
Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	2
Missing bricks	⚠	3
Local Wall Collapse	⚠	3
Loose Brickwork	⚠	3
Wall Settlement	-	-
Structural Cracking	⚠	2
Surface Spalling	⚠	2
Pier Support Removed	⚠	3
Vegetation	⚠	2

Extent of Damage	
1	Moderate
2	Severe
3	Very Severe



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Panel 7: Wall Defect / Deterioration Checklist

Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	2
Missing bricks	⚠	3
Local Wall Collapse	⚠	3
Loose Brickwork	⚠	3
Wall Settlement		-
Structural Cracking	⚠	2
Surface Spalling	⚠	2
Pier Support Removed	⚠	3
Vegetation	⚠	3

Panel 8: Wall Defect / Deterioration Checklist

Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	2
Missing bricks	⚠	3
Local Wall Collapse	⚠	3
Loose Brickwork	⚠	3
Wall Settlement	-	-
Structural Cracking	⚠	2
Surface Spalling	⚠	1
Pier Support Removed	⚠	3
Vegetation	⚠	2

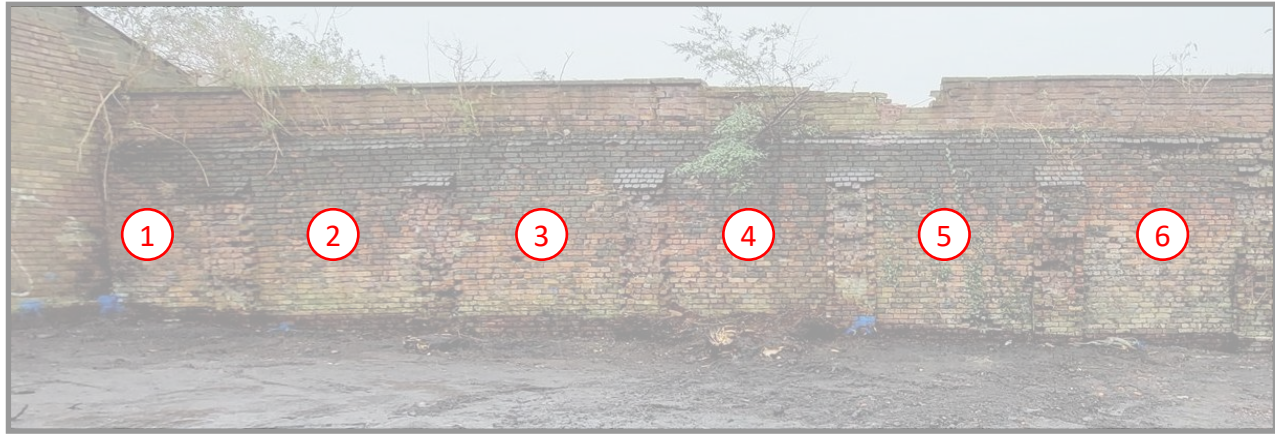
Panel 9: Wall Defect / Deterioration Checklist

Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	1
Missing bricks	⚠	1
Local Wall Collapse	⚠	1
Loose Brickwork	⚠	2
Wall Settlement	-	-
Structural Cracking	-	-
Surface Spalling	⚠	1
Pier Support Removed	⚠	1
Vegetation	⚠	1

Extent of Damage	
1	Moderate
2	Severe
3	Very Severe



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Wall Height Estimate



Panel 10: Wall Defect / Deterioration Checklist

Description of Damage	Observed	Extent of Damage
Mortar Deterioration	⚠	2
Missing bricks	⚠	3
Local Wall Collapse	⚠	3
Loose Brickwork	⚠	3
Wall Settlement		-
Structural Cracking	⚠	1
Surface Spalling	⚠	1
Pier Support Removed	⚠	1
Vegetation	⚠	2