

Technical Note

Waste House Roof Assessment

Project: Brunswick Mill

Client: Arrowsmith Group

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1.0 Introduction and Brief

At the request of Arrowsmith Investments, a structural assessment was undertaken on the existing concrete roof of the Waste House area at Brunswick Mill, Bradford Road, Manchester M40 7EZ. The objective of the inspection was to evaluate the condition of the roof structure and determine its suitability for incorporation into the proposed refurbishment scheme. A non-intrusive inspection was carried out on 29th June 2024.

2.0 Roof Formation

The roof structure comprises a flat reinforced concrete slab spanning between structural steel beams, which are themselves supported by the existing masonry wall lines.

3.0 Observations

The inspected section of the roof was found to be in a critically poor structural condition. Clear signs of prolonged water ingress were present, accompanied by extensive spalling at the soffit and widespread exposure of embedded reinforcement. In numerous areas, the concrete exhibited marked brittleness, crumbling or spalling upon light contact indicative of advanced material degradation. Where reinforcement was visible, surface corrosion was evident, suggesting that deterioration has been both active and progressive over an extended period. Representative photographs illustrating the observed condition are provided in Appendix A.

4.0 Review

The extent of visible deterioration strongly suggests the presence of significant underlying structural damage. Surface-level issues such as cracking, spalling, and corrosion are often symptomatic of deeper, more widespread degradation of the concrete and reinforcement. Once corrosion initiates particularly in damp or humid environments it tends to accelerate rapidly, compromising the bond between steel and concrete and weakening the overall structural system. In such conditions, conventional patch repair techniques are unlikely to offer a durable solution. While they may temporarily restore surface appearance, they do not effectively rehabilitate the embedded reinforcement, which may continue to deteriorate, ultimately undermining the long-term success of any remedial intervention.

The current condition of the concrete and reinforcement presents a serious safety risk. Loose material and corroded steel components pose a high likelihood of falling debris or even partial collapse, endangering anyone working directly beneath the structure. The environment below the roof is considered unstable, and any attempt to carry out repairs from this position could inadvertently trigger further structural failure due to the unpredictable nature of the damaged elements.

Review Continued

Moreover, the compromised integrity of the roof significantly limits the effectiveness of standard protective measures. Temporary solutions such as boarding, propping, or debris netting may offer limited mitigation but cannot fully safeguard against sudden shifts or collapse.

Beyond the structural deficiencies, the roof does not appear to meet current performance standards. Its original design and materials likely fall short of modern building regulations, particularly in relation to load-bearing capacity and thermal insulation. The presence of standing water, along with clear signs of prolonged moisture ingress, indicates that the roof is no longer effectively sealed. Retrofitting a reliable waterproofing system under such compromised conditions is highly complex and often fails to deliver durable, long-term performance. .

From both a technical and economic standpoint, the scale and severity of deterioration suggest that full replacement may be more viable than repair. When factoring in labour, materials, safety measures, and ongoing maintenance, reconstruction is likely to offer a more efficient, cost-effective, and reliable solution.

Conclusions

The roof structure is currently at significant risk of failure due to a combination of severe concrete deterioration, extensive reinforcement corrosion, and persistent water ingress. These interrelated issues have critically undermined the structural integrity of the slab, increasing the potential for sudden collapse and posing serious safety risks to both building occupants and site personnel.

Inspection findings revealed widespread damage, including brittle and heavily spalled concrete, substantial exposure of reinforcement, and clear evidence of long-term moisture penetration. These conditions suggest a considerable reduction in load-carrying capacity. Without intervention, the roof slab is likely to experience partial or complete structural failure.

Despite the extent of concrete degradation, the original supporting steel framework appears to be in a condition that may allow for salvage. To preserve these elements, it is recommended that all surrounding concrete be carefully removed to fully expose the steel members. Once accessible, corroded areas should be thoroughly cleaned—ideally using mechanical methods such as grit blasting—and subsequently treated with a high-performance anti-corrosion coating. This process will help extend the service life of the steelwork, provided that the concrete is reinstated using appropriate materials and detailing to prevent future water ingress and ensure long-term durability.

APPENDIX A

Photographs

Photographs: Structural Defects



Photo 1 - Waste House Roof

Examples of roof deterioration - exposed reinforcement, corroded steels concrete spalling



Photo 2 - Waste House Roof

Examples of roof deterioration - exposed reinforcement and concrete spalling



Photo 3 - Waste House Roof

Water staining and moss growth evident throughout



Photo 4 - Waste House Roof

Heavily corroded support steels throughout



Photo 5 - Waste House Roof

Examples of roof deterioration - exposed reinforcement corroded steels concrete spalling.



Photo 6 - Waste House Roof

Examples of roof deterioration - exposed reinforcement corroded steels concrete spalling.



Photo 7 - Waste House Roof

Examples of roof deterioration - exposed reinforcement corroded steels concrete spalling.

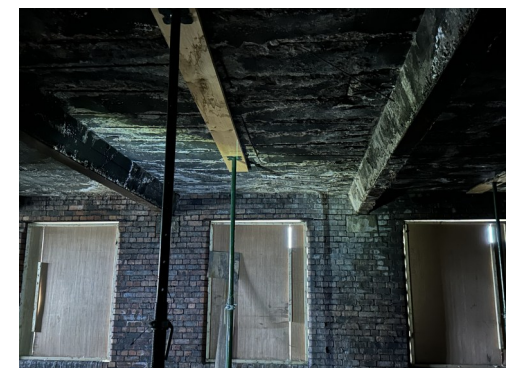


Photo 8 - Waste House Roof

Examples of roof deterioration - exposed reinforcement corroded steels concrete spalling.

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