

Technical Communication

TC No: **TC-101**
Revision: **P01**
Date: **09/07/2026**

Project Ref: **21052-LHO**
Project Name: **Manchester Refurbishment, 90 Bridgewater St, M1 5JW**

Info/Action By: **Project Team / Local Authority**

SUBJECT: Broadhurst House: Ventilation Louvre Options Appraisal and Justification

Ref: Planning Application: 145409/FO/2026
Ref: Listed Building Consent: 145410/LO/2026

1. Introduction

This options appraisal has been prepared in response to comments received from Manchester City Council requesting further justification for the proposed location of new ventilation louvres associated with the refurbishment of the basement accommodation at Broadhurst House.

The purpose of this appraisal is to demonstrate that alternative locations for the ventilation terminals have been considered and assessed in terms of technical feasibility, structural implications, operational performance and impact upon the historic building.

2. Existing Situation

The proposed works require mechanical supply and extract ventilation to serve the refurbished basement accommodation. The existing arrangement includes a single louvre on the canal elevation, with the proposal introducing additional ventilation openings to provide the required air supply and extract in accordance with current Building Regulations and mechanical ventilation design requirements.

The canal elevation is currently relatively uncluttered, whilst the internal courtyard elevations contain a greater number of existing service penetrations and louvres.

A number of alternative locations have therefore been assessed.

Option 1 – Ventilation via the Ground Floor Central Courtyard

Description

This option considered routing the ventilation ductwork from the basement to discharge within the central ground floor courtyard.

Assessment

Whilst visually preferable from a planning perspective, this option is not considered technically feasible.

The mechanically ventilated space is located within the basement; however, the basement footprint does not align with the ground floor areas surrounding the courtyard. Achieving a route to the courtyard would require extensive vertical ductwork passing adjacent to existing structural columns and through reinforced concrete downstand beams supporting the upper floors.

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In addition, the proposed louvre location would be located a considerable distance from the ventilation plant serving the basement accommodation. This would result in an excessively long and complex ductwork route, creating increased resistance within the ventilation system. To maintain the required airflow rates, larger ductwork and associated plant may be required, resulting in increased service sizes throughout the building.

The installation of larger ductwork would have a greater visual and physical impact on the historic building fabric, requiring more extensive intervention and reducing the ability to sensitively integrate the services within the existing structure.

Creating the necessary penetrations through structural elements, together with the increased ductwork requirements, would adversely affect both the structural integrity and historic significance of the listed building.

Conclusion

This option is discounted due to:

- Significant structural implications.
- Excessive intervention into the listed building fabric.
- An impractical ductwork route requiring extensive structural alterations.
- The excessive distance between the ventilation plant and the proposed louvre location, resulting in longer duct runs and potentially larger ductwork with an increased impact on the historic fabric.

Option 2 – Relocate Louvres into the Basement Car Park

Description

This option considered locating the ventilation louvres within the existing basement car park.

Assessment

Although structurally achievable, this option is not considered suitable from both a building services and heritage perspective.

The basement car park already contains vehicle exhaust ventilation systems. Introducing fresh air intakes adjacent to these systems would create a significant risk of contaminated air, including vehicle exhaust gases and particulates, being drawn back into the office ventilation system through recirculation. Such an arrangement would compromise indoor air quality and would not provide a suitable fresh air source for occupied office accommodation.

Furthermore, the proposed termination point would be located a significant distance from the basement ventilation plant. This would necessitate a substantially longer ductwork run, increasing pressure losses within the system and potentially requiring larger ductwork to achieve the required ventilation performance.

The increased duct sizes and more complex routing would result in greater intervention within the listed building, with a corresponding increase in the visual impact of exposed services on the historic fabric.

For these reasons, the option is not considered to provide a technically or environmentally acceptable solution.

Conclusion

This option is discounted due to:

- The risk of recirculation of vehicle exhaust emissions into the ventilation system.
- Poor indoor air quality for the proposed office accommodation.
- The excessive distance from the ventilation plant requiring longer ductwork runs and potentially larger ductwork.
- Increased intervention within the listed building and a greater visual impact on the historic fabric.

Option 3 – Louvres Located within Existing Glazing (Proposed Option)

Description

This option proposes incorporating the required ventilation louvres within existing glazed panels on the canal elevation.

Assessment

This solution provides the shortest and most direct duct route from the basement plant whilst avoiding intervention to the building's primary structural frame.

The proposal:

- avoids alterations to structural beams or columns;
- minimises intervention to the historic fabric;
- significantly reduces construction complexity;
- avoids contamination from basement car park ventilation;
- provides an appropriate fresh air source; and
- allows the ventilation system to operate efficiently.

Locating the louvres within existing glazing also limits the extent of permanent alteration to the listed masonry by utilising elements that can be more readily adapted and, if required in the future, more easily reversed than alterations to the stone façade.

Whilst the canal elevation is more publicly visible than the courtyard elevations, this option represents the only technically robust and operationally compliant solution identified.

Conclusion

This is considered the preferred option as it:

- is technically feasible;
- avoids structural intervention;
- protects the significance of the listed building by minimising permanent alterations;
- provides compliant ventilation performance; and
- offers the least harmful overall solution when balancing heritage, engineering and operational requirements.

Overall Conclusion

Three potential locations for the ventilation louvres have been assessed.

The central courtyard option has been discounted due to the significant structural intervention required to route ductwork through the building, together with the excessive distance between the ventilation plant and the proposed termination point. This would require lengthy ductwork runs and potentially larger ductwork, resulting in greater intervention and visual impact on the historic fabric.

The basement car park option has similarly been discounted as it presents unacceptable risks to indoor air quality through the potential recirculation of vehicle exhaust emissions. In addition, the increased distance from the ventilation plant would require longer and more complex ductwork routes, potentially necessitating larger ductwork with a corresponding increase in intervention within the listed building.

The proposed location within the existing glazing on the canal elevation therefore represents the only viable solution capable of delivering the required ventilation performance whilst minimising intervention to the building's historic fabric.

It is therefore considered that the proposed solution represents the optimum balance between operational performance, engineering practicality and the conservation of the listed building, resulting in the least harmful and most sustainable outcome.

Kind regards,

Stephen Last

For and on behalf of Seven Architecture