
Subject New Victoria | Part L, Overheating and Noise

Date 9 October 2019

Job No/Ref 255644-00

New Victoria Part L and Overheating

The purpose of this note is to outline the latest design development status of the Part L assessment and Overheating analysis for the proposed New Victoria Development.

The Part L SAP result previously submitted within the Planning Application (June 2016) was undertaken prior to an overheating assessment being completed, since this was an early design stage (i.e. early RIBA WS2) and was based upon a simplified typical single apartment basis to inform the design coordination at this time and the subsequent Planning Application.

Since this time, the project has progressed through to the end of RIBA WS3 with more detailed coordination undertaken between various specialists and Design Team members. Specialist input from Facades, Acoustics etc has enabled a robust response to the technical challenges for this site to be overcome within the current design. In addition, further assessment on overheating has been undertaken in accordance with CIBSE TM59. This design development has resulted in a reduced percentage improvement over Part L, which now requires discussion with the Planners to seek their approval.

This note outlines a high-level summary of the design development undertaken since the original Planning Application. The aim of this is to outline how achieving the requirements of noise and overheating have affected the Part L result and to communicate that the current design represents a robust solution to the variety of technical challenges for this proposed development.

1 Planning Submission

Features of the 2016 Planning Application Energy Statement:

- Highly-insulated façade
- Natural ventilation to minimise risk of overheating
- Good pass over Part L 2013

The Energy Statement submitted as part of the Planning Application for New Victoria in 2016 indicated that at that stage of design development, it was expected that a 7.6% pass over Part L 2013 was achievable. This was based on the assumption that summer cooling would be provided by natural ventilation via opening windows, and glazing with high solar transmission would be suitable. However, site restrictions make this strategy unviable.

2 Restrictions

General restrictions include compliance with:

- TM59 overheating analysis which has onerous targets
- Site restrictions included multiple sources of external noise limit opportunities for window opening to mitigate overheating

New Victoria is situated on the northern fringe of Manchester city centre on Corporation Street. The site is subject to a number of noise sources, including traffic noise from the nearby ring road, low frequency noise from the Manchester Arena, wheel squeal from the trams/tram line and PA announcements from the train station. Due to the noisy site, the façade has been designed to minimise noise break-in in order to achieve the internal noise criteria.

Overheating calculations referred to later in this note have been carried out to the strict methodology laid out in the new Chartered Institute of Building Services Engineers Technical Memorandum 59 (CIBSE TM59), which was formally issued in June 2017 (i.e. after the original Planning Application). This provides a standardised approach for the assessment and reporting of residential overheating as a growing concern within the industry. It urges designers and developers to carry out noise and pollution assessments before assuming a building will be naturally ventilated and to be mindful not to contradict acousticians' recommendations.

3 Part L and Overheating Challenges

Improved Part L compliance works against overheating performance:

- Well-insulated façade reduces opportunities for apartments to cool naturally
- Solar gains reduce heating requirement (and emissions), but increase apartment temperatures

Part L is concerned with the conservation of fuel and power, and the SAP calculation is based on an energy balance taking into account a range of factors that contribute to energy efficiency. These include thermal performance, air leakage and solar gains.

The façade of New Victoria has been designed to maximise the thermal performance and minimise energy use. The design was described in the planning Energy Statement in the following way:

The residential blocks will utilise a high performance envelope aspiring to standards over and above Part L requirements. As a result of the high thermal performance of the walls, the use of highly efficient triple glazing, minimised thermal bridging, and infiltration of outside air by sealing the building envelope, the demand for space heating will be minimised.

The solar gain through the glazing has two effects:

- Beneficial gain – Reduced heating requirement in winter, leading to lower CO₂ emissions and better performance against Part L
- Unwanted gain – Increased temperature in summer, leading to an increased risk of overheating

Whilst maintaining the high thermal performance outlined above, the solar transmission (or g-value) of the glazing can be tailored to resist or transmit solar gain radiated into the building. The effects of this are illustrated below, and help to explain the development of the overheating strategy in the later sections of this document.



Achieving a satisfactory overheating performance within residential developments particularly is of upmost importance. There are several recent examples of developments with overheating issues within the UK and this has been a fundamental part of the design development to date.

4 Ventilation Strategy

The updated ventilation strategy has the following features:

- Thermal performance of opaque fabric elements maintained
- Increased mechanical ventilation allows overheating risk to be minimised
- Higher performance glazing with reduced g-value utilised
- The implications of the strategy include:
 - Higher-spec glass
 - Larger MVHR units and associated ductwork, attenuation, etc.
 - Reduced solar gains allow Part L compliance, but without the 7.6% improvement anticipated in the Energy Statement

Following the approach of a natural ventilation strategy outlined in the Energy Statement, it is possible to comply with the CIBSE TM59 overheating criteria. However, to gain sufficient cooling effect, windows are required to be open around 50% of annual hours, including some night-time hours.

Given the noisy site location, the resultant noise within the apartments from these opening hours is unacceptable, and natural ventilation is not a viable solution for overheating.

A full mechanical ventilation solution was investigated to understand whether this could be used to overcome overheating. Mechanical Ventilation with Heat Recovery (MVHR) units are provided in

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each apartment and are designed to provide background ventilation rates. They are also designed to provide a boosted ventilation rate, but have limited capacity therefore solar gains need to be limited to minimise the ventilation rate required for cooling.

The proposed solution is a mechanical-led mixed approach. Choosing an MVHR operating point within the duty of available products and allowing windows to be opened only when the mechanical ventilation cannot satisfy internal conditions, it is possible to simultaneously meet the required acoustic and overheating performance.

By reducing the g-value, the solar gains are reduced. This in turn reduces the amount of cooling required via the mechanical ventilation.

This approach relies on a reduced g-value, designed to:

- Minimise the hours that the windows are required to open
- Reduce the duty of the MVHRs to minimise ventilation noise

With this reduced g-value, the overall SAP performance is reduced, and it is deemed that a marginal pass over the CO₂ emissions from Part L 2013 is achievable.

5 Summary

Energy conservation is an essential consideration for all projects and is rightly prescribed in terms of minimum standards by the Building Regulations. Constantly pushing the boundaries on this is a challenge within the Construction Industry.

There are additional challenges for this project, namely avoiding excess Overheating and Noise. Both of these elements directly affect the quality of accommodation for residents within the proposed development. We have met with the Environmental Health Officer (EHO) during design development and they have signed off the current proposed design in terms of noise.

These elements are not mutually exclusive from the energy usage within the building and although the current design still satisfies the minimum requirements of Part L, the expected result exceeding Part L previously contained in the original Planning Application is not achievable.

The current design is pushing the boundaries of what is possible with the proposed construction and existing site constraints and we believe this to have been robustly tested to date.

We believe the current proposal is a holistic design that balances noise ingress, overheating and conservation of energy.