Written submission by Andrew Ford BSc DEng CEng FCIBSE PPCIBSE opposing the application
Planning Applications: upgrade heating and windows Alexandra Road Estate
20 February 2025
Heating Infrastructure: 2023/5338/P
Heating Infrastructure:building building consent: 2024/0091/L
Windows and thermal improvements: 2023/5339/P
Windows and thermal improvements listed building consent: 2024/0286/L

I am a past president of CIBSE, the Chartered Institution of Building Services Engineers. I recently retired as Professor of Systems Engineering in the Built Environment at London South Bank University. During my ten year residency I was an external examiner for both UCL, Engineering and Architectural Design MEng and UWE's B Eng (hons) Architecture and Environmental Engineering. This followed my 30 year career founding and growing the award winning integrated engineering design practice Fulcrum Consulting which is now part of Mott MacDonald.
I began my career at Max Fordham and Partners in 1974 working on Alexandra Rd heating. Alexandra Rd is widely considered one of the most important housing schemes ever constructed. Thus perhaps the most important thing to do whilst considering its retrofit is to go back to the beginning and understand the designer's aims and ambitions.

If we ar e to list buildings to preserve their uniqueness, what's the point if these are ignored?
I would note that Alexandra Rd is special not only because of its design as a building but also because it involved a unique visionary working relationship between the architect and engineer where they both sought to fully integrate the engineering design into the fabric. This has had a direct effect on the evolution of the Architectural and Engineering professions.

This building is an early example of a 'thermally activated structure' where heating is embedded in the structure to maintain stable comfort. An ambitious idea for the quality of thermal construction available in the 1970's, where zero insulation, single glazing and no attempt to control air leakages was normal. However it is important to realise that it led directly to designs such as 'The Elizabeth Fry ' building at UEA noted as 'The Best Building Ever?' in the April 1998 Building Services Journal. (https://www.usablebuildings.co.uk/UsableBuildings/Unprotected/Probe/FRY/FRYApr98.pdf)
Already by the late 90s low energy building design had moved sufficiently to make Alexandra Rd's 'thermally activated structure' approach capable of delivering not just outstanding comfort but extreme energy efficiency when correctly combined with modern insulation and ventilation.

This retrofit is the opportunity to make Alexandra Rd an exemplar for the future once again but the proposals as presented are backward looking and technically risky.

Max Fordham's letter August 1972 clearly states his target was to provide stable background heat from the walls utilising large low temperature surfaces to achieve high levels of radiant comfort and carefully avoiding intermittent heating to prevent condensation and mould growth only meeting structural heat losses with the walls. It is clear from Max's letter the walls were never intended to provide full heating but rather deliver a minimum background level whilst allowing the ventilation air heating to make up the difference and permit temperature variations between dwellings without risk. The health risks of mould have become very well understood and recently embodied in Awaabs Law 2023.

At Alexandra Rd this 1970's design explores a way to the future our understanding of low energy / low carbon design has continued to move on enormously in construction over the following

decades. We are now at the point where new builds can have near zero heat demand with a 'Passivhaus' integrating heating, insulation and ventilation design with the fabric.
There is clear logic in improving the fabric at Alexandra road for the next forty years lowering the heat loss and improving comfort and health as well as reviewing the heat sources and distribution. Various things are critical. The building will have cold bridges almost whatever is done given its cross wall cast concrete construction. This, I suggest, might almost require heat input into the wall to avoid condensation and the resulting mould risk. Going for radiators allowing intermittent heating and the wall to cool is risky. Careful consideration must also be given to the approach to ventilation to deliver both healthy conditions and energy reduction.

High quality double glazing and airtight windows will make a noticeable difference to both comfort and reduction of heat losses. I am sure it can be integrated into the large glazing near invisibly with some careful attention to design. Whether it is actually necessary to utilise vacuum glazing I doubt, unless something in the listed consent is forcing this. The building should seek to minimise structural heat loss through insulating the roof, basement and walls as much as permitted by the listing.
Maintain the thermally activated walls to provide stable background heating and prevent condensation risk. Lower the distribution temperatures to be as near ambient as possible to enable high efficiency for heat pumps and begin conversion of the central plant to heat pumps immediately, not at some future date. This can be done in stages working partially with gas boilers if there is any uncertainty. It should be possible to deliver something akin to a large version of the 'Balanced Energy Network' we installed at London South Bank University as a future demonstrator (www.benuk.net) efficiency would be very high and carbon impact immediately reduced.
All the dwellings have hot water cylinders. I suggest conversion to electric hot water supply makes sense, possibly utilising something like 'Mixergy' as we did at LSBU or perhaps a heat pump cylinder combination to ensure plenty of available hot water and heat for the ventilation air. There are extensive flat roofs crying out for photovoltaic panels which could then offset a lot of the hot water heating and electrical load.

I see little discussion of ventilation. This ***must*** be an essential feature as the building heat losses and wall temperatures are reduced. I would recommend a whole home heat recovery system. Given that distributed ventilation was part of the original concept it might be relatively simple to achieve. It will improve comfort and significantly reduce heat demand. I must stress that all changes to the heating system and insulation levels must always be considered simultaneously with a ventilation strategy and properly thermally modelled to ensure cold bridging is not a risk. This is not a typical building but it could yet become an exemplar again. I think this should be at the heart of retrofit and seek to decarbonise this important, listed, 20th century building.

It is clear that the main distribution pipework is a problem. Adding constant fresh water will have accelerated decline. Why this occurred is open for debate but we are where we are . It looks as if it will need replacing. How to ensure future long life and low maintenance is worthy of further discussion but will depend upon other decisions.