Energy Efficiency and Adaptation – justification for proposal to install and air conditioning unit

Note: policies CC2 and the CPG on Energy Efficiency and Adaptation (collectively referred to as "The Policies").

## Background:

When considering this application we would like to draw the council's attention to the works completed on the site since acquisition of the property in May 2013. The property itself is an end of terrace property of unremarkable architecture and was constructed around 1970 of double brick cavity without substantial insulation. At the time of purchase the house had aluminium framed windows, that whilst double glazed, were in poor condition and the frames did not incorporate a thermal break. In addition the central heating boiler was old and energy inefficient, the roof was roughly half flat deck and the remainder slightly pitched covered by membrane, neither incorporating any substantial thermal insulation. There was also a glass roof covering a ground floor room at the rear which was single pitch and in poor condition due to age, again with no thermal break incorporated into the framing.

After acquisition and in anticipation of starting a family we made 3 related planning applications:

- 2015/2386/P 90 Camden Mews London NW1 9BX Roof extension to provide additional internal living space at 2nd floor level, retention of part of existing roof terrace, and associated works;
- 2016/1970/P 90 Camden Mews London NW1 9BX Variation of condition 2 (use of zinc) and condition 3 (approved plans) of planning permission 2015/2386/P, dated 25/06/2015 (for roof extension), namely to allow the use of slate roof tiles; and
- 2017/4195/P 90 Camden Mews London NW1 9BX Replacement of existing glass roof over ground floor rear extension with dual pitched glazed roof and erection of bike/bin store to front elevation of existing single dwelling (class C3).

The planning applications sought to improve the physical building both for ourselves and to provide a positive impact on the Camden Square Conservation Area in which the property sits. Given the reaction and support from the neighbours in our street and the lack of any objections to the works we believe that this was successful.

The works covered by these planning permissions were completed by the end of 2017 and we moved back in earlier that year and have lived in the property since.

## **Cooling hierarchy:**

The policies make significant reference to the cooling hierarchy, this is summarised in para 8.43 of CC2 and more fully in 10.7 of the CPG. Para 10.6 of the CPG states, "Active cooling (such as air conditioning) is discouraged, unless the applicant can demonstrate exceptional circumstances where opportunities for cooling are unable to be controlled through passive measures alone."

Taking each point of the cooling hierarchy in turn how we believe that they have been addressed were possible within the site and planning constraints, by the works completed in 2016/17:

1. Minimise internal heat generation through energy efficient design

- We have replaced the existing central heating boiler with a Vaillant ecoTEC plus 624 System Gas Boiler which has an "A" rating and 94% efficiency;
- Inclusion of low energy LED lighting replacing older less efficient bulbs;
- Zonal heating controls have been included to maximise energy efficiency;
- Due to the existing building being almost 100% site coverage we are unable to alter the layout/orientation of the building or to include any water features or planting around the house.

2. Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls:

- We have added substantial insulation to the house under the new roof, into the walls of the new upper storey but also crucially added it internally to the ground floor walls where possible;
- All windows have been replaced with new thermally broken, high efficiency Schuco windows and doors;
- The front door to the property has been replaced with one made of a highly insulating composite material;
- The glass roof to the rear of the property was replaced with a high quality modern structure which includes thermally broken frames and SunGuard SuperNeutral SN 70/37 glass to reduce solar gain. The glass has a U value of 1.0 and a solar factor (g value) of 37% as per The Policies;
- The design approved includes the retention of 2 balconies;
- The front elevation included the retention of the boxing above the windows to provide shading;
- The house was constructed of London brick and the extension was built to match, London brick being one of the lighter possible shades of brick;
- All windows have lined (and bedrooms blackout) curtains although it is not possible to always leave these closed during the day as noted in the CPG;
- Due to the location of the property within the conservation area the roof was required to be either Zinc (2015/2386/P 90) or natural slate tile (2016/1970/P) both of which unfortunately absorb substantial amounts of heat;
- Clearly the orientation of the building cannot be changed without demolition and would not be permitted in planning terms due to the street scape, similarly the window apertures were set by the existing structure and location of the balconies so could not be altered.

3. Manage the heat within the building through exposed internal thermal mass and high ceilings;

- From investigations as part of the works we undertook the ground floor of the house seems to sit on a concrete pad, within which the pipes for the underfloor heating are sunk. This is overlaid with 20mm thick marble tiles. This flooring is exposed and offers a substantial thermal mass to aid cooling of this floor. However it is not feasible to include any further mass at the upper levels as the floors are of standard timber joist construction and would not carry the weight.
- Ceiling heights as you will see from the cross sections included in planning application 2015/2386/P 90 we have sought to maintain the maximum possible floor to ceiling height within the building with c2.5m clear height in the principal rooms, in addition we incorporated a double height void between the 1<sup>st</sup> and 2<sup>nd</sup> Within the physical constraints of the existing building and streetscape requirements of the conservation area we are unable to increase height any further.
- 4. Passive ventilation;

- As an end of terraced house the property benefits from opening windows to the front and rear elevations at all levels, furthermore there are 4 new velux roof windows included to allow venting at the top of the house and opening panels in the new glass roof to the rear;
- As per the drawings in planning application 2015/2386/P the house includes an open plan design with the stairs not being enclosed as they run up the building, this is further bolstered by the provision of an adjacent void between the first and second floor with a velux window directly above the void allowing the property to take full advantage of the "stack effect" detailed in Chapter 3 of the CPG.
- 5. Mechanical ventilation;
  - Having reviewed the technical papers issued by the Passivhaus Trust (see <a href="https://www.passivhaustrust.org.uk/UserFiles/File/Technical%20Papers/How%20">https://www.passivhaustrust.org.uk/UserFiles/File/Technical%20Papers/How%20</a> to%20Build%20a%20Passivhaus%20-%20Rules%20of%20Thumb%20-%20compressed.pdf) it is just not possible to retro fit the house which was built in 1970 to adopt Passivhaus principles with mechanical ventilation and cooling given the existing brick construction of the building fabric with double glazing as it will never achieve the required level of air tightness or insulation to make the approach work (see page 15 of the document for example). There is also insufficient space in the property to include the air handling unit or to retrofit the ducting in the floors as they are standard depth.
- 6. Active cooling;
  - Looking at page 21 of the CPG Installation of a ground source heat pump would not be viable in this property because:
    - 1. This could not reasonably be sunk underneath an existing row of terraced houses without substantial demolition of the existing building, risk to surrounding properties and complete replumbing of the entire house;
    - 2. The existing 1970s building would most likely be insufficiently insulated for the approach to work;
    - 3. The system would require substantial electrical energy to run; and
    - 4. The current heating system is not compatible with a low temperature system.
  - Looking at page 22 of the CPG an Air source heat pump (ASHP) is suggested where there is no gas connection and where heating demand is isolated and for a short period of time. The property benefits from a mains gas connection and suitable central heating system which is of Grade A energy efficiency and in the winter requires heating for extended periods making this an unsuitable approach in this instance;
  - The single unit proposed is technically a heat source pump and is taxed accordingly (rather than an air conditioning unit) as it can provide heating as well as cooling and will be mounted on a wall of the second floor balcony and will not therefore utilise any roof space, in any case it is a requirement of planning consent 2016/1970/P 90 that the roof is covered only by natural slate and not a green roof; and
  - The proposed unit has highest possible efficiency rating of A for both heating and cooling.

## **Experience:**

Despite all the measures noted above being included in the design as part of the recent renovations it has been our experience that in accordance with para 10.6 of the CPG

during periods of hot weather, "Opportunities for cooling are unable to be controlled through passive measures alone." To provide some specific examples:

- 25<sup>th</sup> July 2019 with external temperatures reaching 38 degrees during the day our house was still 34 degrees at 11pm;
- 12<sup>th</sup> August 2020 the digital thermometer showed a reading of 29 degrees at 4am;
- 13<sup>th</sup> August 2020 the internal temperature was 31 degrees at 2pm.

Whilst these may be considered more extreme temperatures for London, periods of hot weather in the summer months mean that the internal temperature frequently reaches 29-30degrees. This is important as whilst it is very uncomfortable for adults it is notable from the official NHS advice (<u>https://www.nhs.uk/conditions/pregnancy-and-baby/reducing-risk-cot-death/</u>) and the Lullaby Trust

(<u>https://www.lullabytrust.org.uk/safer-sleep-advice/baby-room-temperature/</u>) that, "*The chance of SIDS [Sudden Infant Death Syndrome] is higher in babies who get too hot, so try to keep the room temperature between 16 -20°C"*. As babies sleep during the day as well as in the evening (our son still naps twice a day) such lower temperatures are required for safety reasons both during the heat of the day and in the evening/overnight.

In order to allow our son to be able to sleep we actually checked into a hotel in Central London with air conditioning over the night of 13<sup>th</sup> August 2020 and receipts can be provided on request.

## **COVID 19:**

In accordance with the Council's own experience during the pandemic we are now working from home for the foreseeable future and will continue with substantial amounts of home working thereafter. This is a pattern that is expected to be widely replicated with numerous companies announcing permanent work from home flexibility. As a result I would therefore suggest that the council policy of permitting air conditioning for offices, shops, hotels and other commercial premises but not residential settings may now need to be revisited as offices have much lower utilisation rates and homes higher in future.

## **Other Considerations:**

As noted in the application and noise report the area surrounding the property is of mixed use, with the Lord Stanley pub (and beer garden) immediately behind (including a substantial air handling unit externally), and the Ashton Court development opposite (which appears to be C3 residential usage from a planning perspective according to consent 2015/4553/P) which also has included a single air conditioning unit in their redevelopment (see previously provided materials). The converted Church on the corner of North Villas and Camden Park Road opposite the Lord Stanley Pub also has at least 3 external condensing units visible serving the residential properties, providing substantial local precedent even excluding the other commercial units on York Way and Camden Road which all have air conditioning fitted.

There have also been no formal objections noted to the council and in an informal consultation with our neighbours on Camden Mews we also received 3 expressions of support for this application and no objections.

Focusing solely on energy efficiency also misses the other important health considerations that installing such a unit brings in terms of being able to exclude the noise pollution from the pub beer garden behind the house, and emergency services sirens on Camden Park Road in particular, which disturb us when working from home and when the baby is sleeping. Additionally opening all the windows also allows in a substantial amount of construction dust which is caused by the large number of developments on Camden Mews including opposite at Ashton Court where 5 new houses with basements are being constructed. Such dust is also detrimental to health particularly in infants.

# **Conclusion:**

As detailed above all passive cooling measures and insulation that can reasonably be incorporated into the property have already been included and dangerously high temperatures are still being reached with a regularity that puts our family at risk of suffering the tragedy of SIDS, particularly if we were to be lucky enough to have further children. The single heat source pump unit proposed has the highest Grade A energy efficiency rating and meets all other planning and policy requirements and would provide much needed additional cooling capacity for the property.

20/08/2020