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DESIGN & ACCESS STATEMENT DOCUMENT

MAISONETTE FLAT 2 ON FIRST, SECOND, THIRD & ROOF

PMRCA/87CR-DA 02 REV 03

PROJECT: PROPOSED REMODELLING OF EXISTING RESIDENTIAL MAISONETTE FLAT 2 ACCOMMODATION ON FIRST, SECOND, ROOF ATTIC WITH A NEW REAR SECOND FLOOR ADDITION WITH NEW ROOF TERRACE OVER, CHANGES TO REAR FENESTRATION, NEW REAR DORMER TO THIRD FLOOR WITH PHOTOVOLTAIC CELL PANELS OVER & NEW PHOTOVOLTAIC CELL PANELS TO FRONT PITCHED ROOF TO PROPERTY.

LOCATION: 87 CONSTANTINE ROAD, LONDON NW3 2LP.

Statement:

This is a design access statement for the whole residential property owned by the Client, Bretislav Borak, which comprises two flats.
It is important that the proposed separate two flat developments are read in conjunction with the whole property statement and therefore each planning application uses the same statement with the relevant specific matters ** marked where specifically applicable to Flat 2.

Details of existing property:

The property is mid terrace, late Victorian dwelling house dating from about 1889.
Arranged on ground, first, second, third/roof floors with a two storey rear addition.
Front and rear gardens.
The original Freehold single family dwelling which internally has been re-configured as two self contained flats, one on the ground floor and the other (maisonette) on the first/second/third/roof floors.
The ground floor entrance hall is common to both flats with the ground floor flat entrance door off the hallway and the maisonette flat entrance door is at the head of the connecting ground to first floor staircase.
Total gross internal area of 153.7 sq m (1654 sq ft)
Ground floor 57.42 sq m (618 sq ft)
First floor 57.42 sq m (618 sq ft)
Second floor 38.86 sq m (418 sq ft)
Third floor/roof 36.72 sq m (390 sq ft)

Existing Accommodation:

Ground floor flat 1:
Front Reception 3.93 x 4.66 into bay = 18 sq m
Master Bedroom 1 3.30 x 3.37 = 11 sq m
Back addition
Bathroom/toilet
Kitchen/Breakfast Room 3.25 x 3.97 = 13 sq m

Maisonette flat 2:
First floor
Bedroom 1 (front) 3.49 x 4.65 = 16 sq m
Kitchen 1.53 x 2.73 = 4 sq m
Bedroom 2 (rear) 3.30 x 3.34 = 11 sq m
Bathroom and separate toilet
Bedroom 3 3.29 x 3.38 = 11 sq m

Second floor
Bedroom 4 (front) 5.23 x 3.94 = 21 sq m
Bedroom 5 (rear) 3.33 x 3.37 = 11 sq m
Third floor/roof

Attic room 7.2 x 5.1 = 37 sq m

Materials:

The building is constructed in 343mm and 225mm solid brickwork with red brick to the front elevation, stone mullions, arches and sills to the bays and stone surrounds to the main entrance door. The windows are timber box frame double hung sliding sash windows.

The main property roof is a double pitched roof (front to back) clad in blue slates with two roof windows to the front and two to the rear.

The rear fenestration is constructed in a mix of red brickwork with mainly timber box frame double hung sliding sash windows and glazed timber framed double doors leading from the rear addition from the ground floor flat to the rear garden
The first floor rear addition fenestration is finished with self coloured smooth render and has a glazed timber single door leading onto the timber balcony/platform and staircase which provides access to the rear garden for the maisonette flat.

Town Planning & Statutory Matters:

Planning authority London Borough of Camden.
Relevant Planning Applications comprise:
The conversion of no.87 Constantine Road, Hampstead into a self contained flat and self contained maisonette – permission decision granted 17-02-1954.
The erection of a staircase from the first floor and the rear extension at 87 Constantine Road, N.W.3 to provide access to the garden – permission decision granted 02-05-1972.
Not a listed building.
Located in the Mansfield Conservation Area.

Planning history of Nos. 85 and 101 Constantine Road.
E9/2/10/18654 - The conversion of No. 87, Constantine Road, Hampstead, into a self-contained flat and a self-contained maisonette – Granted 17/02/1954
2015/6381/P - 86 Constantine Road - Erection of rear dormer window, creation of terrace at 3rd floor level with installation of a metal balustrade and access door and 3 front rooflights. – Refused 23/03/2016 – Appeal allowed 27/04/2016
2017/2650/P – 82 Constantine Road - Erection of rear dormer window with access door, creation of roof terrace with balustrade at 3rd floor level and installation of two front rooflights. – Granted 21/08/2017

STATEMENT IN RESPONSE TO PRE-PLANNING APPLICATION ADVICE DATED 04/06/2021 REFRENCE 2021/1829/PRE FROM THE LONDON BOROUGH OF CAMDEN, PLANNING SOLUTIONS TEAM:
This is a statement for the whole property which comprises two flats.
It is important that the proposed two flat developments are read in conjunction with the whole property statement.
The specific statements for each flat is:
Flat 2 specific content marked **
Flat 1 specific content marked **

Dear Ms. Constantinescu,

- My client Mr. Bretislav Borak, has read your review of my submission for pre-planning advice for his property at 87 Constantine Road, NW3 2LP, and has written the following paper in response with independent copies to Cllr Sian Berry and Cllr Jenny Mulholland Cllr Marcus Boyland, Cllr Larraine Revah Bethnay Cullen and Jennifer Walsh to clarify his deep misgivings. The submitted concept design was produced with extensive input from my client. Please understand that his response is not intended to be an attack on the reviewer, but is using the review to illustrate areas where he feels that Camden's planning policies and procedures conflict with the needs of both the elderly, the medically vulnerable. He also aims to illustrate areas where the Borough of Camden could improve its services to its residents, and to express his interests in sustainability, energy conservation, health, and his house and home of 50 years.

Dear Councilors,

I am resident and owner of 87 Constantine Road, NW3 2LP, and have decided to undertake a major renovation of the home that I have owned since 1972. My Architect Mr. Philip M Roys RIBA, submitted a pre-planning document to Camden Planning, and the responding report was deeply disappointing. I have therefore, written the following paper to clarify my deep misgivings with its content and to illustrate those areas where I contend that Camden's planning policies and procedures conflict with the needs of both the elderly and the medically and mentally vulnerable. I also aim to illustrate areas where the Borough of Camden could improve its services to its residents, and to express my interests in sustainability, energy conservation, health, and my house and home of 60 years.

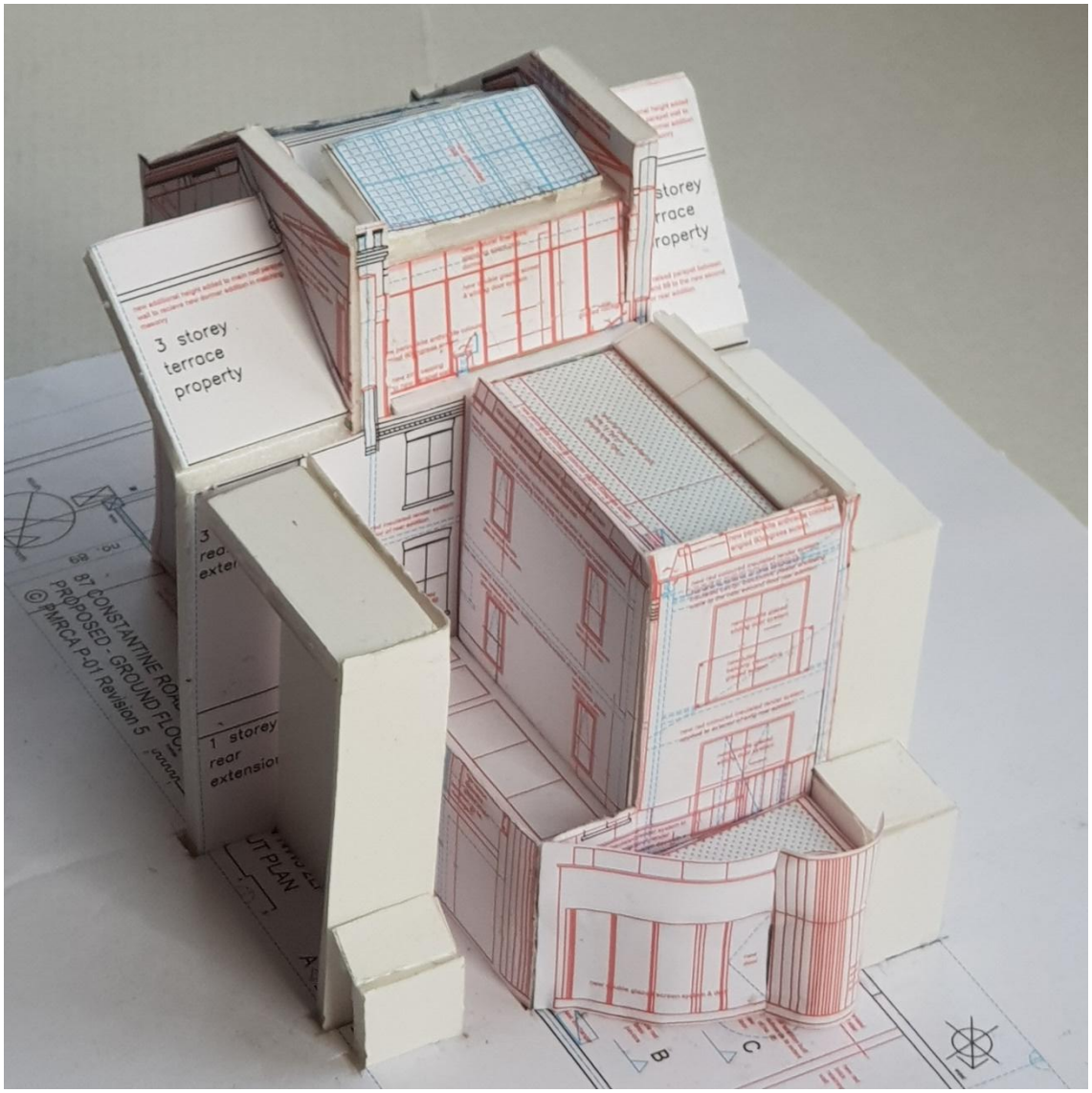
I beseech you to read it to the end, as I am deeply concerned that several of Camden's planning policies are dangerous to the health and wellbeing of the elderly and vulnerable citizens of our borough. In addition, several of these policies make it difficult to integrate energy saving and sustainability measures into renovation projects involving Victorian houses.

I am giving you a new USB flash drive (no viruses) with the appendices and references to the paper, so you may view them on a laptop or desktop computer as you read the paper document. To access the references you will need an internet connection, open the 'References' file which I have saved in both Microsoft Word and PDF formats, place your mouse cursor on the reference address, hold down the CTRL key on your keyboard and click your left hand mouse button and it will take you to the original reference document.
I would welcome your feedback and comment on my paper.

04 January 2022

How Planning Policy inhibits the implementation of sustainability and energy saving technologies and imperils the health of the medically vulnerable.

Bretislav K.J. Borak



The Project

87 Constantine Road
NW3 2LP

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Introduction

Camden's planning documents state that we are entering a period of Global Warming, and they could not be more correct. In the past the UK has enjoyed a temperate climate which is now changing, resulting in hotter summers for longer periods, and eventually resulting in intense summer heat similar to Los Angeles (see reference 1), Jakarta or Singapore; colder winters with weather similar to Helsinki, Oslo and Anchorage, and increasing storms, rain and drought as stated in section 10 of Camden's guidelines. Camden's policies and guidelines do not take account of these factors for older people living in their own homes. The guidelines do not fully reflect the upcoming necessity to mitigate the effects of Global Warming on the internal environment of buildings built to historical standards and specifications. Camden has made extensive use of the term "overheating", a term with a nebulous definition. The guidelines do not specify at what temperature, for how long, and at what humidity an overheating instance occurs (See reference 2). "Overheating" for an extended period to a young person may be a sweaty inconvenience, but to an older person such as myself at 75 years of age, it presents much more risk. "Heat waves, or periods of anomalous warmth, do not affect everyone; it is the vulnerable individuals or sectors of society who will most experience their effects. The main factors of vulnerability are being elderly, living alone, having a pre-existing disease, being immobile or suffering from mental illness and being economically disadvantaged" (reference 3).

The planning policies and guidance do not reflect the danger to an older person's health due to a buildings internal temperature and humidity, or the ozone, NO2 and NOx laden air. With a myriad of health conditions it could be a death sentence (see appendix 2). It has been scientifically established that when the outside temperature is above 25°C for longer than two days, passive mitigation measures are insufficient to reduce the internal temperature and humidity to a comfortable level for a vulnerable resident (reference 2). In fact I am using portable air conditioning to mitigate the effects of last year's extreme heat, which had a deleterious effect on my wellbeing. The system that I am proposing is both more energy efficient and more effective than these portable units.

Recent extreme weather events in the UK

Reference: London Climate Change Partnership; paragraph 1 - climate change p.1
http://climatelondon.org/climate-change/

Extreme weather isn't just a problem for the future: it's something that affects us already. If we look back over the last 20 years we can see extreme weather incidents have affected us almost every year. In fact, considering the frequency of extreme weather events, what has previously been considered "extreme" may now be the new normal.

2000 – flooding
2001 – flooding
2003 – heatwave
2005 – flooding
2006 – drought
2006 – heatwave
2007 – flooding
2008 – flooding
2008 – snow and ice
2009 – snow and ice
2009 – flooding
2010 – flooding
2010 – snow and ice
2011 – warm spring
2011 – warm autumn
2012 – drought
2012 – wet summer
2013 – snow and ice
2013 – heatwave
2014 – flooding
2015 – flooding
2015 – heatwave
2016 – heatwave
2017 – heatwave
2018 – snow and ice
2018 – heatwave

There was also a major heatwave in **2020**.

The trend and scientific information is clear.

**Camden says we need to reduce our carbon footprint from fossil fuels, and I agree. Solar energy sources are one of the best alternative methods to carbon or nuclear based energy production, both of which are increasing in cost by the year. The situation is now exacerbated by the impending ban on new gas fueled boilers by 2035. However, solar technology is improving by leaps and bounds. Perovskite solar panels that replace glass in buildings (see references 5 and 6)(windows), greenhouses (references 7, 8 and 9), parking structures, (see reference 10), panels for East-West configurations and 12 degree tilt angles (see reference 13), and on green roofs (see references 11 and 12) should be encouraged as per CPG Home Improvements p24, not discouraged.

We should be integrating solar alternatives wherever we can to replace fossil fuels, including roofs (see references 15 and 16), terraces, gardens and balustrades (see reference 14) (also with perovskite solar panels). Camden's blanket condemnation of domestic air conditioning ignores the differences between the systems available. There are ducted systems with exterior compressors (used domestically across the USA), and there are units utilizing cooling towers (usually office buildings), and ductless systems (used extensively across Asia) that can also use heat pump technology. The latest equipment which provides both (air to air heat pump) heating and cooling (one example is Fujitsu multi-split systems – (see appendix 15), but several manufacturers offer similar products) are both energy efficient and run on solar power as an alternative to fossil and nuclear fuel based alternatives. Both Camden and The Environment Agency object to air conditioning due to their electrical energy consumption from the grid, which in my case will be mitigated by solar panels. However, Camden planning makes no distinction between these different systems, merely stating that air conditioning is discouraged for domestic use and will only be permitted where its need is demonstrated and the steps in the cooling hierarchy are followed (Local Plan policy CC2).

Camden needs to make provision for elderly and vulnerable citizens in their own homes (a stated Camden objective) to mitigate the grave dangers to health posed by heatwaves. The current policy seems to overlook these needs. The vast majority of pensioners in Camden cannot afford the required cost of exterior and interior wall insulation to install A/C and prohibitively expensive heat pumps. It is difficult to insulate the exterior of (Victorian) houses divided into flats with different owners if one of them is in need of relief from heatwaves. A heat pump to a flat owner on an upper floor may be legally impractical and cost prohibitive.

I would also point out that the number of technicians qualified to install these systems is still extremely limited (see Reference 18) and that even the Environment Secretary George Eustice has stated he does not have one and that the technology is not fully developed (Daily Telegraph 2 November 2021), which is why he has not installed one in his own home. In fact a survey by the Telegraph found that not one Government Minister has a heat pump. Yet, Camden is imposing the technology on homeowners through its Planning Policies.

Camden also asks for creative design solutions. Our submission contains many creative solutions to the numerous Victorian design flaws in my home such as thin walls, small drafty windows over 100 years old, poor quality construction, and shortage of storage. In addition, the lack of adequate daylight in the rooms at the rear of the building has been a major factor prompting me to undertake this project. In winter lack of sunlight affects mood and wellness, as has been well documented medically. My architect has made every effort to mitigate this issue while respecting Camden's policies and guidelines; however, to utilize creative solutions means making modern changes that are outside of old architectural paradigms. In line with this thinking, Camden needs to be more flexible with its guidelines and allow these creative solutions to be utilized. The planning report, although not binding on Camden, exhibits many of these old paradigms.

2. Camden Pre-planning report and owner response:

Rear Dormer

**Camden

- There is an established character of rear dormers along the street.
- The proposed rear dormer due to its wide expansion in all directions, with no relief at eaves level appears as another storey and not as a projection from the roof slope. This would be overly dominant for the roof slope and host building as a whole and in its current form would not be supported in the event of a future planning application. You are advised to consider significant reduction in dormer's dimensions. Please consider the advice in CPG Home Improvements – Roof extensions.
- Proposal includes provision of access from the proposed dormer onto the outdoor amenity space on the roof of the proposed third floor extension. Due to the difference in height between the bottom of the dormer and the roof of the proposed third storey extension, steps are proposed from the dormer along the full width of third floor extension. This appears out of context and exacerbates the dormer dimensions. You are advised that access onto the roof should be very discrete and only relate to not more than a door opening.

**Owner

Your statement that "there is an established character of rear dormers along the street" is incorrect. If you review the videos of the Overground train journey between Gospel Oak and Hampstead Heath I have provided (reference), you will see that no two dormers are the same along the back of Savernake and Constantine roads. The dormer is at the rear of the building, set back from the rear façade and not visible from any streets. In addition, the rear of my house is not visible from the Overground since the cutting for the tracks is too deep at this point; it is hidden by the trees and the basketball court.

I have provided photos of dormers just around the corner on South Hill Park and Tanza Roads (see Appendix 5), which are built similar to my architects intended design. These examples are open to General Public view, whereas my proposed dormer is completely obscured as previously mentioned. Please explain under which policy Camden Planning approved the projects on Park Hill Road which have the same architectural configuration, and the added story to the house on Tanza Road (see appendix 6). My architects design complies with Camden policies D1 paragraphs a, c, d, e, m, the requirement for Excellence in Design and paragraph 7.3 of the Design and the Heritage Policy document. Reducing the size of the dormer as you suggest will greatly complicate it structurally, decrease the habitable area (headroom), reduce the ingress of daylight and the panoramic view (a stated Camden desire) across the railway (which is the Genesis of this neighborhood in the first place see appendix 14), and the roof area available for solar panels. It will significantly increase the cost of construction which as a retired civil servant, who is paying for this renovation from my pension, is not insignificant.

One of the chief objectives of this project is to make my residence as electrically self-sustainable as possible. Hence I am willing to pay to insulate and render those areas not covered by glazing, and to make changes in order to comply with the LETI Climate emergency guide and the GIS Adapting Dwellings to Climate Change. I am also looking to add PV panels on both the front and rear roofs (of the dormer) to provide carbon neutral energy generation to run the heating/cooling units.

Third floor extension with terrace

**Camden

- The extension would follow the footprint of the existing rear closet wing. The proposed extension would appear to match the height of the adjacent three storey closet wing at no. 85 which is accepted. The rear of the properties further east along Constantine Road follow this pattern and therefore it would be an appropriate type of extension in this location and context.
- The proposed terrace would occupy the whole roof of the extension below and be surrounded by panels which the D&A suggests they are Solar PV panels. This is a novel intervention which seems at odds with their location on a north facing elevation. Also, the panels due to their nature, colour, and material, would add bulk at roof level and appear as an alien feature at the rear of the property, so you are advised to remove these.
- The proposed terrace expanse is considered harmful to the character and appearance of the host building and wider area due to the cumulative impact arising from the need for balustrade and privacy screen to address harmful overlooking to the rear dormer at no. 85 Constantine Road, which would add clutter to the rear elevation. You are advised to reduce significantly the proposed terrace to a modest balcony surrounded by traditional metal railings. The remaining part of the roof could accommodate a green roof. See CPG Home Improvements on Balconies/Terraces.

- The D&A suggests that the Air conditioning units would be located at this level however they are not visible on the proposed drawings. Air conditioning units are contrary to policies CC1 and CC2 and generally not supported for domestic purposes. If the property suffers from overheating you should consider passive design measures. CPG Home Improvements includes advice in relation to these in Sustainability Chapter and you should complete the table in Appendix 1 and send it as part of any future submission. There is general conflict between the proposed expansive glazing throughout the building and the air conditioning. You are advised to consider the advice on LETI Climate emergency guide on the proportion of solid and void on north facing elevations. Air source heat pumps to provide heating and hot water would be supported in the event of a future planning application, however they should be located at ground level, where they would be less visible and likely to cause less noise and nuisance.

**Owner

Camden claims that "the PV panels due to their nature, colour, and material, would add bulk at roof level and appear as an alien feature at the rear of the property, so you are advised to remove these." Again, these panels are to mitigate the carbon footprint of the property, and a means to reduce the cost of energy in accordance with Camden policy CC1. They will not be visible to people from the opposite side of the Overground rail tracks (a quarter of a mile away), or by the general public or the neighbours who are below the line of sight. I find the statement that they would appear alien very strange, since that would depend on their type and design. For example, perovskite solar panels which come in various colors (see reference 20) can have a very pleasing appearance, and as long as they are receiving daylight they are producing power and fulfilling the objective of Camden policy CC1. If Camden is serious and wants to mitigate Global Warming it should rethink the out of date architectural paradigms which would prevent the implementation of solar power. My project design reflects the stated aims of Camden planning under clauses 8.1 through 8.3 and Policy CC1 of the Climate Change policy.

Camden's review states that "The proposed terrace expanse is considered harmful to the character and appearance of the host building and wider area due to the cumulative impact arising from the need for balustrade and privacy screen to address harmful overlooking to the rear dormer at no. 85 Constantine Road". As can be seen in appendix 8, the dormer on no.85 cannot be seen from the end of my garden and it will be above the line of sight from my proposed terrace. Similarly, the dormer on my house would be mostly obscured by its terrace. I have spoken to Mr. Clark my neighbour who is the resident of the top two floors of No.85, and he is willing to swear under oath that he has no objection to this project, including any overlooking from my property. However, a privacy screen will be provided should it be necessary to prevent any under looking to No.85, which is minimal (see appendix 7).

Camden states that "the terrace is harmful to the character and appearance of the host building" (my building). However, this ignores paragraph 7.23 of the Design and Heritage requirement to provide outdoor amenity space including gardens, balconies and roof terraces. The expanse of the terrace is similar to no. 89 Constantine Road right next door. In fact it complements the rear facades at nos. 85 and 89, (see appendix 8) and will in my opinion enhance the appearance of my home. I am opposed to reducing the size of the terrace to a modest balcony as then it would seem at odds with the rear facades of nos. 85 and 89.

I am also disappointed that Camden should suggest replacing the PV panels surrounding the terrace with railings. Firstly, the panels surrounding the terrace support sustainability and produce electricity no matter what direction they face. These panels could be of perovskite with a similar appearance to coloured glass (see reference 21). Secondly, traditional metal railings, which in my opinion are ugly, use enormous amounts of energy to produce and do not add to sustainability or the charm of the host building. As for the wider area - who is the audience, and what is meant by the wider area? As previously stated, my house cannot be directly observed by the General Public or my neighbours as a panorama of the view from the rear of no. 87 shows (see appendix 9). A green roof or garden will be provided on the terrace and unobtrusive PV panels on the front roof and the dormer.

Neither policies CC1 or CC2 forbid air conditioning for domestic purposes, albeit clause 8.39 states it is discouraged due to the demand for energy. My design uses solar power sources that would provide the energy needed and not draw extra power from the grid. Policy CC1 supports and encourages sensitive energy efficiency improvements to existing buildings (CC1 (d)), which the proposed solar energy production and efficient heating/cooling units provide.

As I have previously stated, A/C is a necessity for the health of vulnerable older citizens during heatwaves and the noxious air associated with them. Policy CC2 (d) requires "measures to reduce the impact of urban and dwelling overheating including application of the cooling hierarchy." With my green terrace roof, insulation on the exterior and interior walls and roof, and double/triple glazing, this requirement is being met. It is difficult or near impossible to <u>further</u> protect a nineteenth century house (or older residents) from the effects of extreme heat, cold, and noxious air which we can expect with the advent of Global Warming; however I am open to Camden's suggestions.

I do not see any conflict between the glazing and air conditioning. As previously stated, the exterior and interior insulation together with the double/triple glazing ensures that the house will be shielded from the exterior elements, the heat, and the noxious air as far as possible during periods of extreme heat and cold. If the skin of the building insulates it from the exterior environment, similarly the exterior is insulated from the interior environment. I shall also be using internal window treatments which would mitigate any heat/cold leakage. Furthermore, the A/C is only used during heatwaves, when the temperature, humidity and noxious air pose serious health concerns. It is NOT intended for permanent usage. The extensive glazing is to bring natural daylight into the building, which is a stated requirement in several clauses of Camden's policies. It also provides large openings for cross ventilation through the building when the weather permits.

The LETI Climate emergency guide recommendations are considered in this design as are the GIS Adapting Dwellings to Climate Change recommendations. The GIS recommendations should also be considered in Camden's review. Both will be implemented as far as is practical within the design.

The Overground trains at the rear of my property go past every few minutes. These trains along with the diesel/electrical locomotives spewing heat and noxious diesel fumes at night both create intense noise pollution. Any noise from the equipment to make my home conducive to my health would be minimal in comparison, directed away from any neighbours and drowned out. The exterior equipment will be screened from view and directed away from my neighbours.

You have recommended air source heat pumps which I am exploring; however, they produce as much noise as the heating/cooling system I have included in appendix 13 and their energy use is comparable. So why is this type of system not a suitable alternative?

<u>Ground Floor infill and single storey rear extensions</u>

<u>*Camden</u>

- The proposed ground floor extensions appear subordinate to the host building in terms of scale and projection, subject to scaled drawings being provided to identify the height of the proposal. Given the length of the proposed infill extension, and potential height, this would result in some level of impact on the amenity of neighbouring occupiers, in terms of loss of outlook and light. You should demonstrate how the proposals have taken this into account and been reduced to address any potential impact.
- The full glazed roof of the infill extension could potentially result in light pollution to the flats at upper floors and neighbouring occupiers at no. 89. You should consider installation of rooflights rather than full glazed roof.
- The D&A explains that the extensions would have a glazed screen on the rear elevation. The proposed rear elevation would have a curved wall which could be an interesting feature, however further details would be required to understand how this would be constructed and relate to the host building. You are advised to consider other materials as part of this elevation treatment to reduce the glazing expanse which is at odds with its position on a north facing elevation.

<u>*Owner</u>

The proposed ground floor extension will be at the same height (or nearly so) and length to the rear extension of no.85 and so would not impact either the light or outlook to that house. If Camden is of the opinion there may be such an impact, why did it approve the extension at no.85 which would have impacted my light and outlook? The impact of the light and outlook is already taken into account by matching the height and length of the extension at no.85. Furthermore since the building faces 320° NW, the sun does not directly strike this rear façade so there is no possibility of my project affecting anyone's light.

The full glazed roof of the infill extension will be revised on the application drawings; however I own the whole of no.87 so I do not understand what is meant by the flats at upper floors. There is only my maisonette above the glazed roof, and I have no objection. As for the occupiers of no.89, they will experience no more light pollution at night than that which I experience from their windows (see appendix 10), and from the basketball court. I

shall also be installing horizontal blinds under this glazing to create an additional heat and light barrier, which would be utilized at night.
Reviewing appendix 1 shows this infill is exactly similar to several infills at the back of Constantine and Savernake roads, which Camden has approved in the past. Why does it feel this infill is any different? Please explain your rationale.
Please explain what you mean by "relate to the host building" of the curved glazed wall. The glazing is to bring natural daylight into a dark space; a stated objective in several of the Camden's planning policies and is an integral part of the creative design. In addition it faces 320° northwest, not due north. Notwithstanding which direction it faces, it will be bringing in daylight, whereas I do not know of any other suitable material that is transparent and allows in daylight other than perovskite. If you know of one, please provide me with this information.

Terrace on roof of the ground floor extension

**Camden
- This would have modest projection, which could be accommodated. In relation to its enclosure as the full glazed curved wall would not be supported, you should explore other materials. As above, generally thin metal railings should be appropriate.
- There is the potential for overlooking into the first floor window at no. 89, and therefore a privacy screen may be required. This should be made of natural materials, with gaps in between with potential to allow plants to grow for further screening if required. Plants in planters at this level could also provide, shade and noise buffering which would improve the amenity of occupiers.

**Owner
I do not understand your statement ""In relation to its enclosure as the full glazed wall", what do you mean by that statement and why would it not be supported? Which Planning policy forbids such a design? Toughened glass balustrades divided into panels are very common and a safe alternative to metal railings. Again I strongly object to having thin, thick or any other metal railings, which are unsightly, and use huge amounts of energy to produce (if Camden wants to reduce its carbon footprint it should refrain from suggesting elements that need smelters to produce).
I have no objection to the suggestion of the privacy screen. I certainly do not want my neighbours overlooking my terrace.

Changes to rear elevation

**Camden
- The proposed new openings on the rear elevation at second floor level on the outrigger are considered excessive and do not respect the hierarchy of openings characteristic for this type of property and wider terrace. The proportion of solid of void clashes with that on the original rear elevation and therefore you are advised to reduce the expanse of openings.
- The proposed balcony at second floor level with the associated balustrade would be out of character with the host building and wider terrace. Overall this element along with the wide expansion of glazing would not be supported in the event of a future planning application.

**Owner
The opening on the second level is to match the one on the ground floor of no. 85 (see appendix 11) and the one below so that the façade looks symmetrical. It also brings in natural daylight and provides an opening to create good natural cross ventilation through the building, which is a stated aim in Camden's CPG. What outrigger? If you are referring to the Juliet balcony on the second floor, Juliet balconies are permitted under Camden' planning policies see CPG Amenity paragraph 2.12. so why would it not be supported under a future application? Which policy statement forbids it?

Solar PV panels on front roof slope

**Camden
- The proposed PV panels appears to sit symmetrically on the roof slope which is accepted.
- They should generally respond to the limitations and conditions of permitted development (Class A, Part 14, GPDO 2015).
- Details of the panels, such as manufacturer specifications to include photos and sections through the roof would be required in the event of a future planning application.

**Owner

I do not understand how we can include photos of a system that has not been installed yet. I understand why Camden would require sections through the roof, but the planning application stage is too early in the design process to come to a decision on a particular system and supplier. This decision requires extensive research since every supplier and installer I have been referred to have recently gone into bankruptcy. It will comply with the limitations and conditions of permitted development (Class A, Part 14, GPDO 2015. It will also be similar to the system installed on the roof of No. 145 Constantine Road (see appendix 12). If Camden has a list of approved manufacturers or suppliers such as that that supplied and installed the panels on the roof of No. 5 Pancras Square, then please help by providing it.

Additional Concerns and deep Misgivings

The Basketball court

Camden has built a basketball court at the end of my garden without consultation and in contravention of several Camden planning policies (see Appendix 4), resembles a prison exercise yard and is totally out of context with the adjoining houses. It is used by people creating a noisy mayhem for adjoining residents and anti-social behavior including gross indecency. It is lit up by floodlights every night without any occupants creating light pollution. This is a waste of energy and public funds. Why doesn't Camden dismantle it and install a wildlife garden or some other amenity that would benefit all the residents of the estate?

Fee

Camden's initial fee demand for my pre-planning advice was £ 3,936 (including vat) which is the fee for residential property conversions with extensions of 1 - 9 units. When my architect reminded Camden that this was a flat and a maisonette Camden apologised and revised to one fee for each. I have only received one report, so in the light of the above would Camden care to issue a revised report that I have already paid for?

Precedent

My architect Mr. Philip Roys, informs me that Camden Planning does not consider previous planning approvals as a precedent for current applications. Precedent has been a principle in law for centuries, so how does Camden ensure equity and consistency across similar projects? Does Camden then rely on the decisions of each individual Planning Officers' interpretation of the Policies, of which to emphasize and which to downplay? It is realized that Planning Policy is a living document and changes over time; however, that should not affect the basic principle of equity between projects.

No. 5 Pancras Square

A google maps search of Camden's new offices at 5 Pancras Square, according to the press releases, is a "robust and simple design, based on a combination of 'passive and active design features' helped achieve this (BREEAM) rating. Key sustainable features include ***maximising daylight to the centre of the building***, an energy-efficient hybrid ventilation system". If this lauded system is so good, can it be scaled down for domestic purposes to be cost affordable for a mid-level Camden professional employee with a mortgage and two children, or a pensioner on a fixed income? Does it scrub incoming air for noxious air in extreme heat events? Does it filter for viruses or bacteria in either incoming or outgoing air, and does it scrub for any noxious fumes from swimming pool disinfectant before expelling it into the atmosphere? An extensive computer search did not reveal technical details for this system (I suspect it relies on a large ground source heat pump) which should be available to the wider design community, since this building was paid for with public funds (notwithstanding those funds came from the proceeds of sale). Furthermore, the company that designed this system is no longer in business, preventing me from contacting them for information.

The press release also indicates this building uses LED lighting sources throughout. Is Camden aware that LEDs emit blue wavelength light that can cause macular degeneration (see appendices 15-17)?

Camden's employees have the luxury of a mechanically assisted internal environment during working hours which uses electrical energy from the grid to operate. The number of solar panels on the roof is insufficient to cover the electrical needs of a building that size.

In periods of extreme heat the employees can even pop down for a swim, whereas medically vulnerable residents who occupy their residences 24/7 are denied that privilege. It would seem there is one rule for Camden and big business and another for the voting, tax paying residents of the borough.

Supplementary Information

Owner Recommendations

1. Why does Camden not provide the applicants for pre-planning a short questionnaire that establishes property ownership, number and ages of the occupants and if any have special (medical or other) requirements? Camden should also ask the applicant to provide photos of the surrounding environment. This would ensure that Camden's planning officers are not working in the blind as the Planning Officer has had to do in my case, and so that they can make informed responses to pre-planning requests.

2. Camden should also supply applicants for pre-planning with a list of available Camden/Central Government grants/financial incentives to implement energy saving and sustainability technologies within its planning reports, so as to encourage their implementation.

3. The blanket condemnation of A/C under clause 8.39 should be specific in which systems are discouraged. Heat pump and A/C systems can both provide cool A/C air, and work on the same mechanics using a compressor, heat exchanger a fan and piping (see appendix 18). Are heat pumps that have an A/C component also discouraged? If not, (then this clause needs to be revised so that it is based on a standard of energy use and/or pollution factors instead. This would give vulnerable and elderly applicants with medical needs a choice of systems that meet the required standards, and not impose one system over another.

4. These preplanning reports should avoid an authoritarian tone, be written in plain English for financiers and owners, who will review them (such as me). They should avoid "architect-speak" or jargon which is confusing and meaningless to a lay person, and vague wording that is highly interpretive. Examples include: "overly dominant for the roof slope and host building"; "new openings on the rear elevation at second floor level on the outrigger"; "the hierarchy of openings characteristic for this type of property and wider terrace"; "the proportion of solid of void clashes with that on the original rear elevation" and "The proposed terrace expanse is considered harmful to the character and appearance of the host building and wider area".

5. In the light of Global Warming, Camden Planning should re-examine and rethink the out of date architectural paradigms that impede the implementation of energy saving and sustainability technologies.

6. The sheer volume of planning documents necessary to understand the do's and don't's of a building design project is daunting. These, including those from the Greater London, and other regulatory bodies, should be rationalized and simplified, so that it is easier for the design and lay communities to understand and implement. The creation of a preplanning advice office indicates the complexity of the system.

Further Reading

https://www.london.gov.uk/sites/default/files/mott_mcdonald_london_impacts_assessment.pdf

http://climatelondon.org/climate-change/heatwaves/

http://climatelondon.org/projects/heat-risk-to-london/

http://www.geothread.net/minisites/retrofit_tool/index.html

https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/temperature/heatwave

https://www.researchgate.net/publication/281105641_London%27s_Warming_The_Impacts_of_Climate_Change_on_London

http://climatejust.org.uk/messages/older-people

https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2017

https://www.sciencedirect.com/science/article/pii/S2212096320300255

http://climatelondon.org/publications/adapting-dwellings-to-climate-change-retrofit-advice-tool/

https://www.solardecathlon.gov/ (of use for Camden Professional Officers who have a requirement for a yearly 'Continuing Education component to their qualifications.)

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1. https://www.latimes.com/projects/california-extreme-heat-deaths-show-climate-change-risks/
2. https://www.zerocarbonhub.org/sites/default/files/resources/reports/ZCH-OverheatingEvidenceReview-Definitions.pdf. See key points and health effects.
3. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291052/scho0807bncw-e-e.pdf
4. http://climatelondon.org/projects/overheating-thresholds/
5. https://www.pv-magazine.com/2020/10/30/perovskite-based-solar-window-tech-from-nrel/
6. https://www.theguardian.com/green-futures/2021/jun/02/solar-bricks-and-smart-glazing-could-your-next-home-be-energy-positive
7. https://www.pv-magazine.com/2020/12/04/rose-growing-with-adaptive-solar-pv-shading-system/
8. https://www.pv-magazine.com/2021/07/02/transparent-solar-panels-for-agrivoltaics/
9. https://www.pv-magazine.com/2021/08/16/pv-powered-geothermal-heat-pump-system-for-greenhouses/
10. https://www.pv-magazine.com/2021/08/17/new-pv-facade-design-in-sweden/
11. https://www.pv-magazine.com/2021/08/24/green-roof-improves-solar-panel-efficiency-by-3-6-on-average/
12. https://www.abc.net.au/news/2021-08-24/nsw-green-roofs-make-solar-panels-more-efficient/100400552
13. https://www.pv-magazine.com/2021/09/07/solar-module-for-east-west-installations-on-flat-rooftops/
14. https://www.pv-magazine.com/2021/09/15/coupling-balcony-solar-panels-with-residential-storage/
15. https://www.pv-magazine.com/2021/10/07/solar-tiles-for-roof-coatings-shelters-facades/

16. https://www.pv-magazine.com/2021/02/17/viridian-solar-unveils-roof-integrated-solar-panels-with-power-of-335-340-w/

17. https://www.dailymail.co.uk/news/article-9720647/Pimlico-Plumbers-boss-gives-verdict-unrealistic-plans-replace-25m-gas-boilers.html

18. https://sid.onlinelibrary.wiley.com/doi/abs/10.1002/jsid.866

19. https://www.iisc.ac.in/wp-content/uploads/2017/09/DTE-LED-Aug2017.pdf

20. https://scitechdaily.com/luminescent-solar-waveguide-windows-generate-energy-from-inside-and-out/

21. Camden Planning Guidance including:

Air Quality
Amenity
Biodiversity
Design
Energy efficiency and adaption
Home improvements
Housing
Planning for health and wellbeing
Camden Planning Guidance (CPG) Energy Efficiency and Adaptation
Camden Local Plan 2017 including Policies H,C,E,A,D,CC and appendices.

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2. https://www.zerocarbonhub.org/sites/default/files/resources/reports/ZCH-OverheatingEvidenceReview-Definitions.pdf. See key points and health effects. Back

3. Doctors letter

4. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291052/scho0807bncw-e-e.pdf Back

5. http://climatelondon.org/projects/overheating-thresholds/ Back

6. https://www.pv-magazine.com/2020/10/30/perovskite-based-solar-window-tech-from-nrel/

7. https://www.theguardian.com/green-futures/2021/jun/02/solar-bricks-and-smart-glazing-could-your-next-home-be-energy-positive

8. https://www.pv-magazine.com/2020/12/04/rose-growing-with-adaptive-solar-pv-shading-system/

9. https://www.pv-magazine.com/2021/07/02/transparent-solar-panels-for-agrivoltaics/

10. https://www.pv-magazine.com/2021/08/16/pv-powered-geothermal-heat-pump-system-for-greenhouses/

11. https://www.pv-magazine.com/2021/08/17/new-pv-facade-design-in-sweden/

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13. https://www.abc.net.au/news/2021-08-24/nsw-green-roofs-make-solar-panels-more-efficient/100400552

14. https://www.pv-magazine.com/2021/09/07/solar-module-for-east-west-installations-on-flat-rooftops/ ;

15. https://www.pv-magazine.com/2021/09/15/coupling-balcony-solar-panels-with-residential-storage/

16. https://www.pv-magazine.com/2021/10/07/solar-tiles-for-roof-coatings-shelters-facades/

17. https://www.pv-magazine.com/2021/02/17/viridian-solar-unveils-roof-integrated-solar-panels-with-power-of-335-340-w/

18. https://www.dailymail.co.uk/news/article-9720647/Pimlico-Plumbers-boss-gives-verdict-unrealistic-plans-replace-25m-gas-boilers.html
https://sid.onlinelibrary.wiley.com/doi/abs/10.1002/jsid.866

20. https://www.iisc.ac.in/wp-content/uploads/2017/09/DTE-LED-Aug2017.pdf

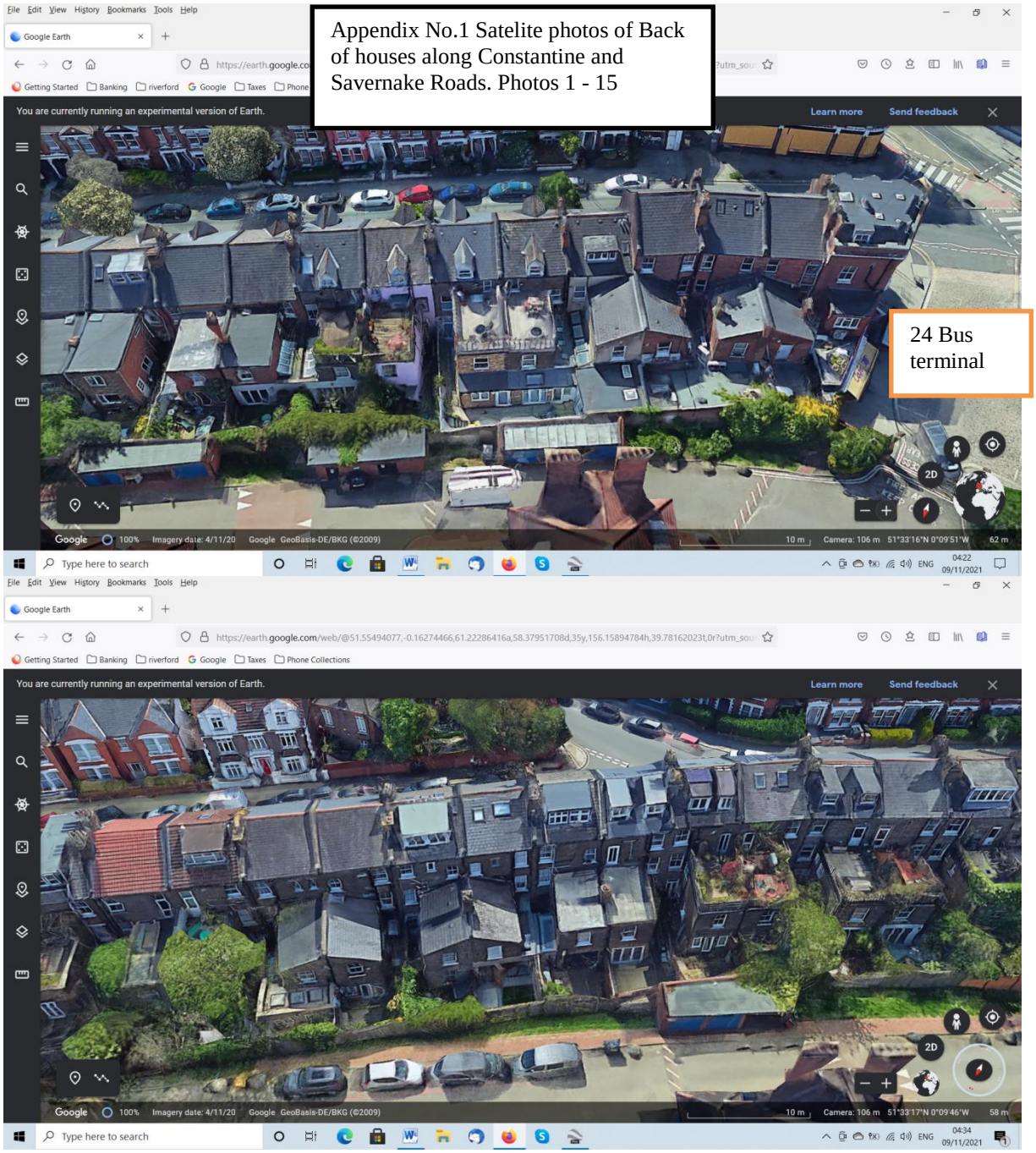
21. Recent extreme weather events in the UK
Reference: London Climate Change Partnership; ¶1 - climate change p.1
http://climatelondon.org/climate-change/
Extreme weather isn't just a problem for the future: it's something that affects us already. If we look back over the last 20 years we can see extreme weather incidents have affected us almost every year. In fact, considering the frequency of extreme weather events, what has

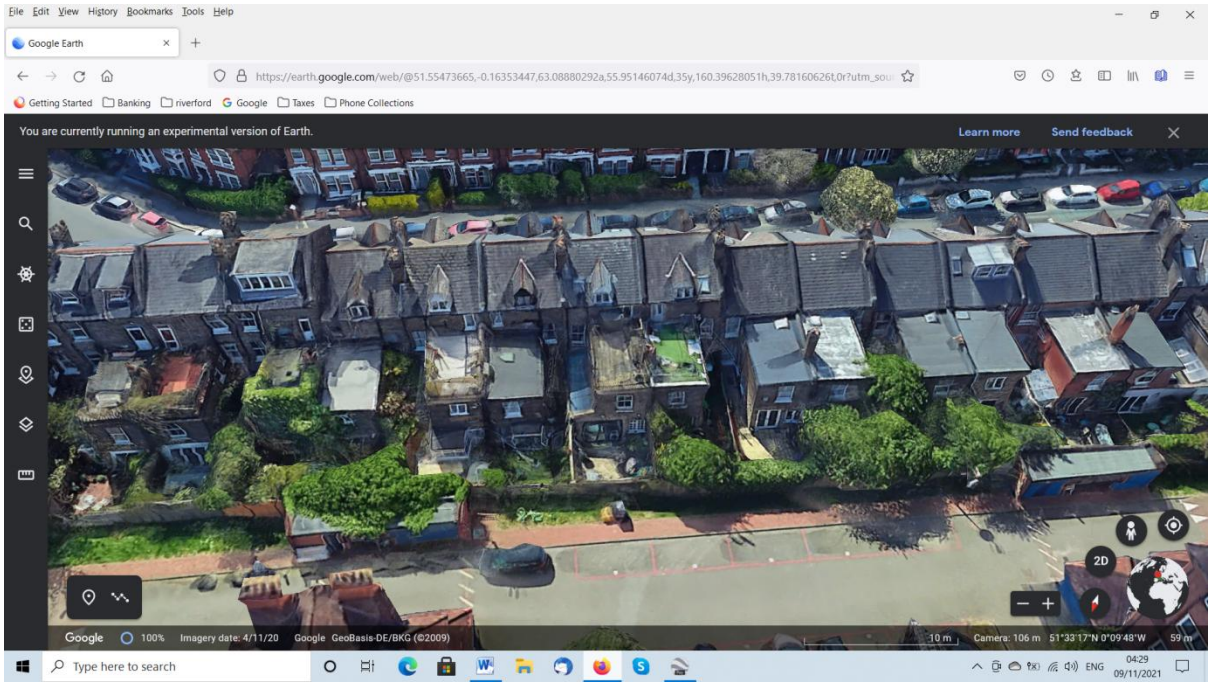
previously been considered “extreme” may now be the new normal.

2000 – flooding
2001 – flooding
2003 – heatwave
2005 – flooding
2011 – warm spring
2011 – warm autumn
2012 – drought
2012 – wet summer
2006 – drought
2006 – heatwave
2007 – flooding
2008 – flooding
2008 – snow and ice
2009 – snow and ice
2009 – flooding
2010 – flooding
2010 – snow and ice
2013 – snow and ice
2013 – heatwave
2014 – flooding
2015 – flooding
2015 – heatwave
2016 – heatwave
2017 – heatwave
2018 – snow and ice
2018 – heatwave
There was also a major heatwave in 2020.

https://www.latimes.com/projects/california-extreme-heat-deaths-show-climate-change-risks/DIY-polyamide-kapton
on LEDs-1.pdfLED bulb
complaint.docxDTE-LED-Aug2017.pdfAssessment of visual
fatigue under LED tunable white light.pdfMake lighting
healthier.pdf

Appendix No.1 Satelite photos of Back of houses along Constantine and Savernake Roads. Photos 1 - 15

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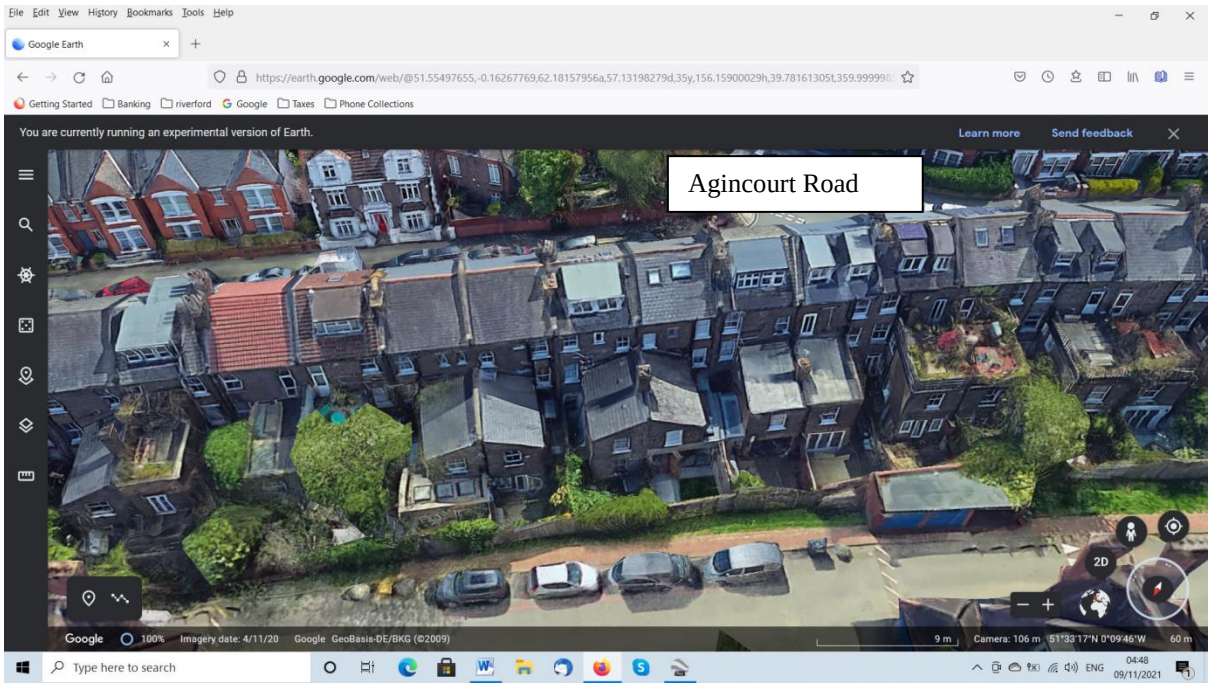
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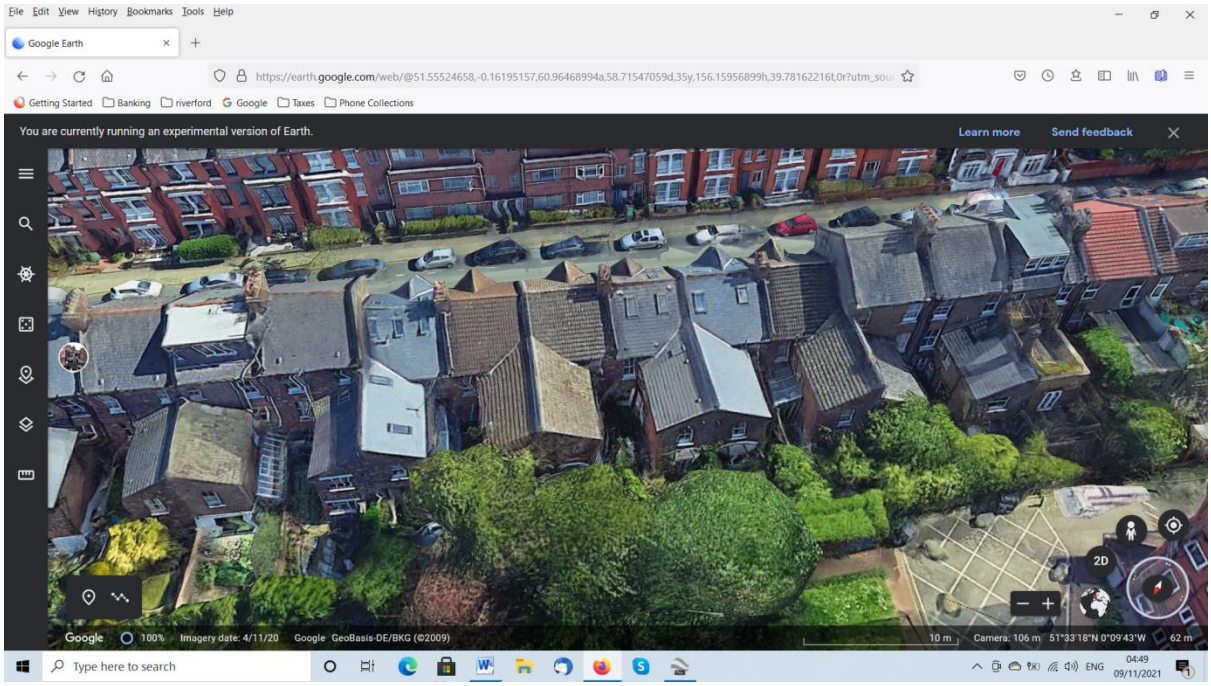
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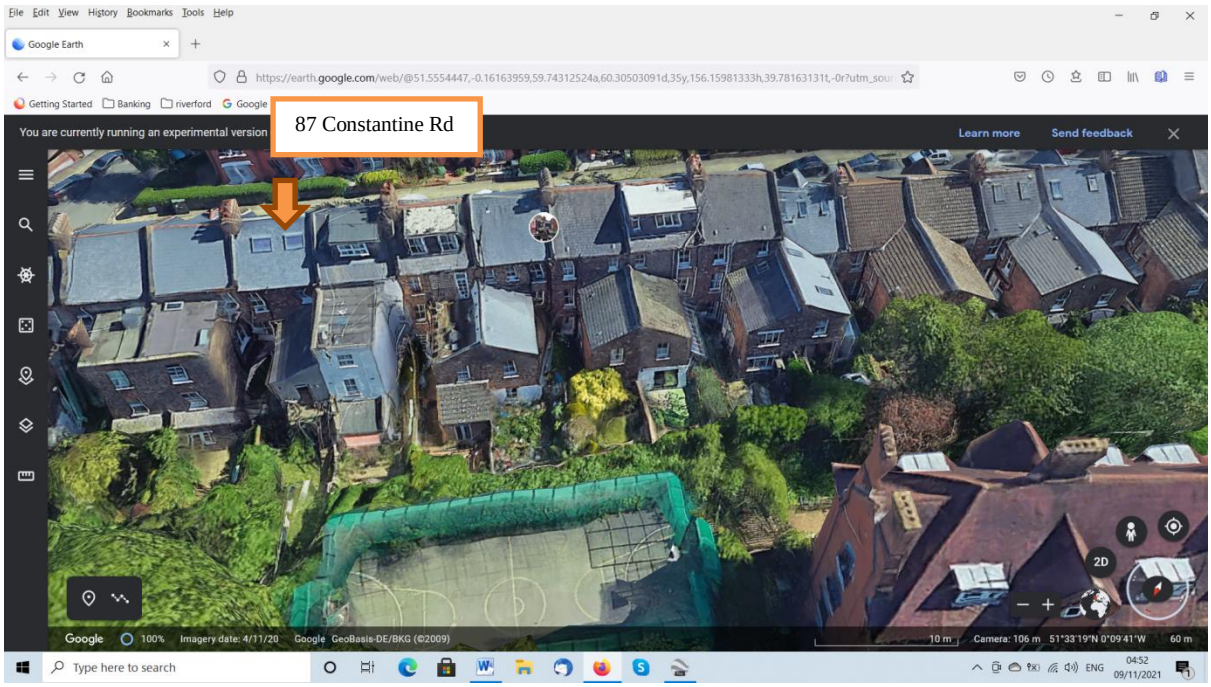
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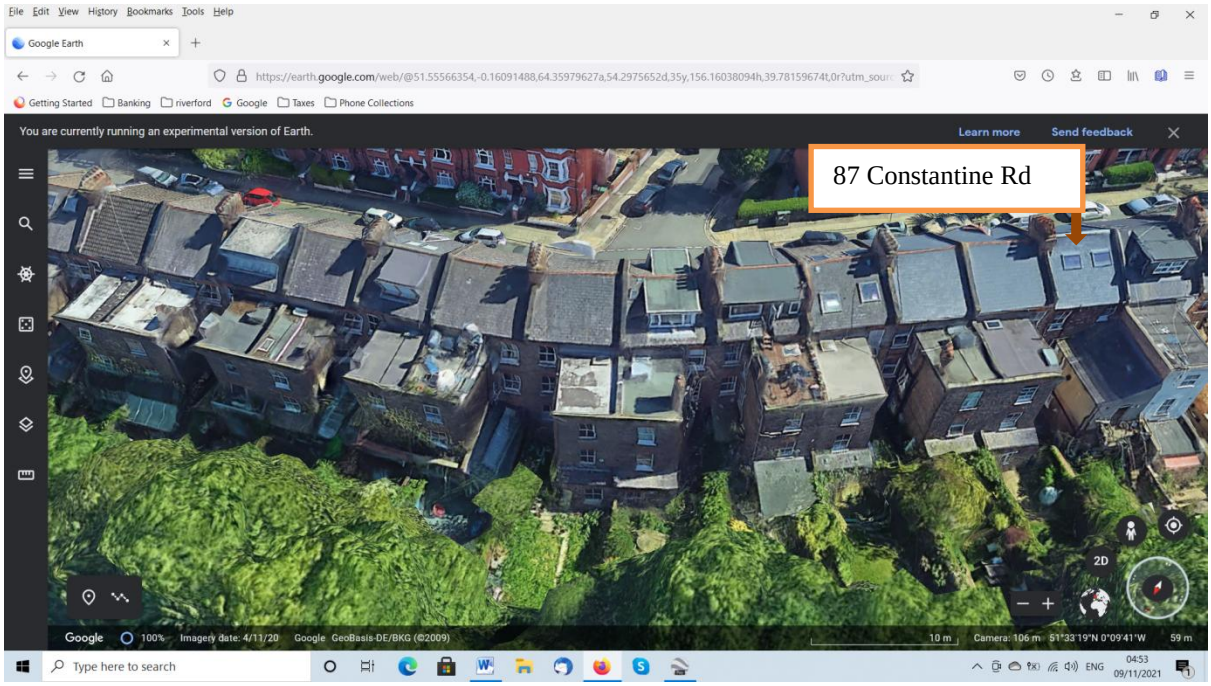
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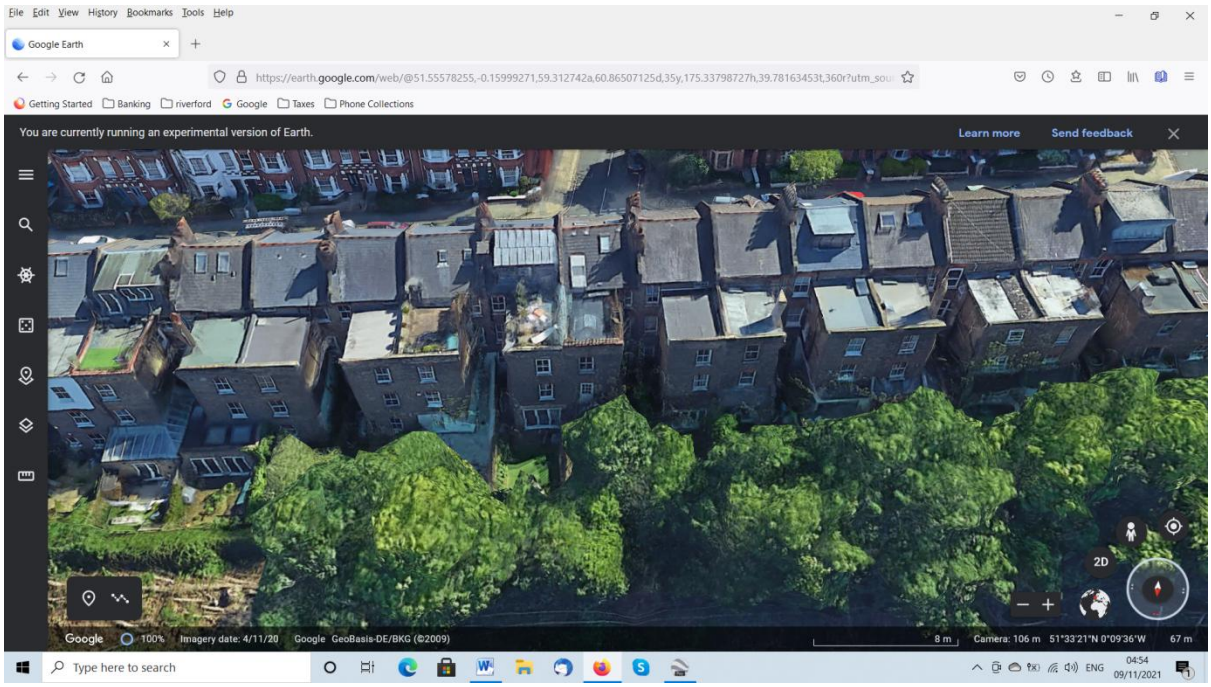
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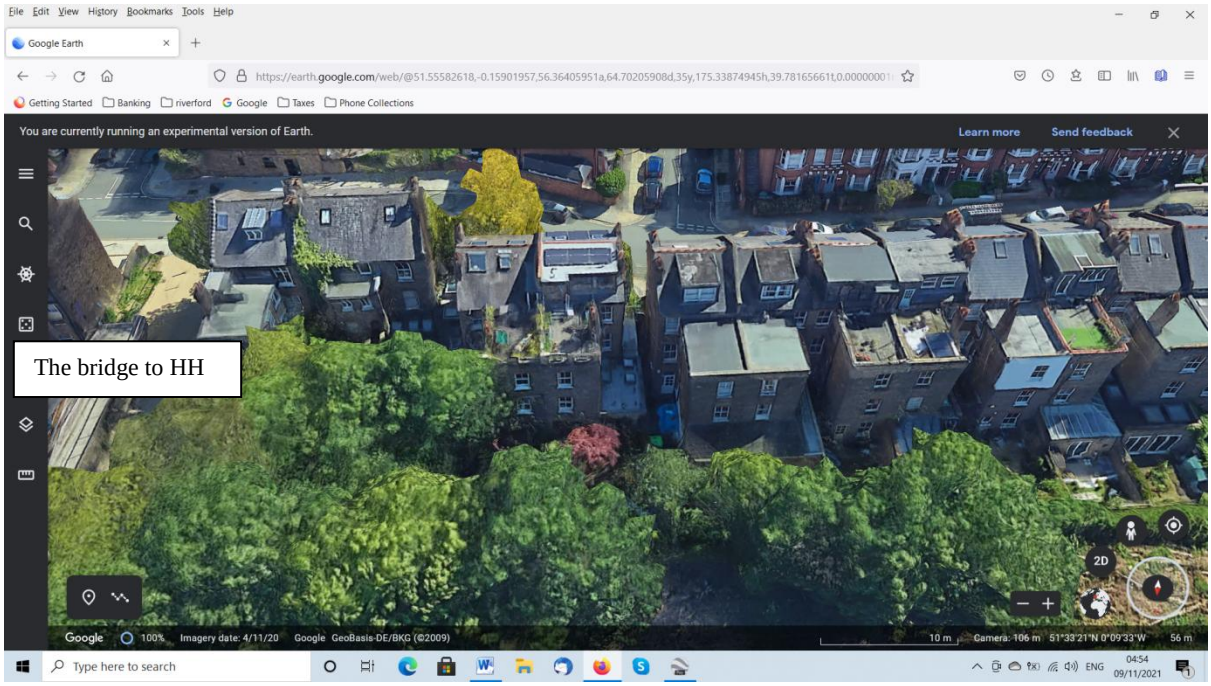
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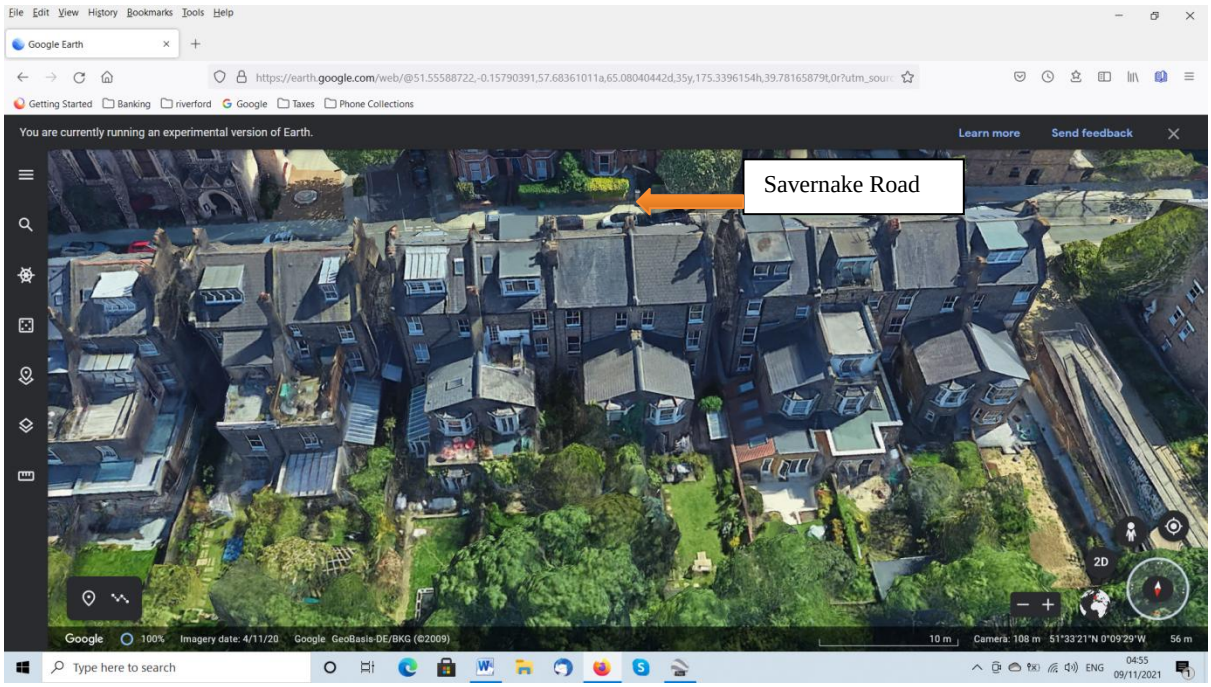
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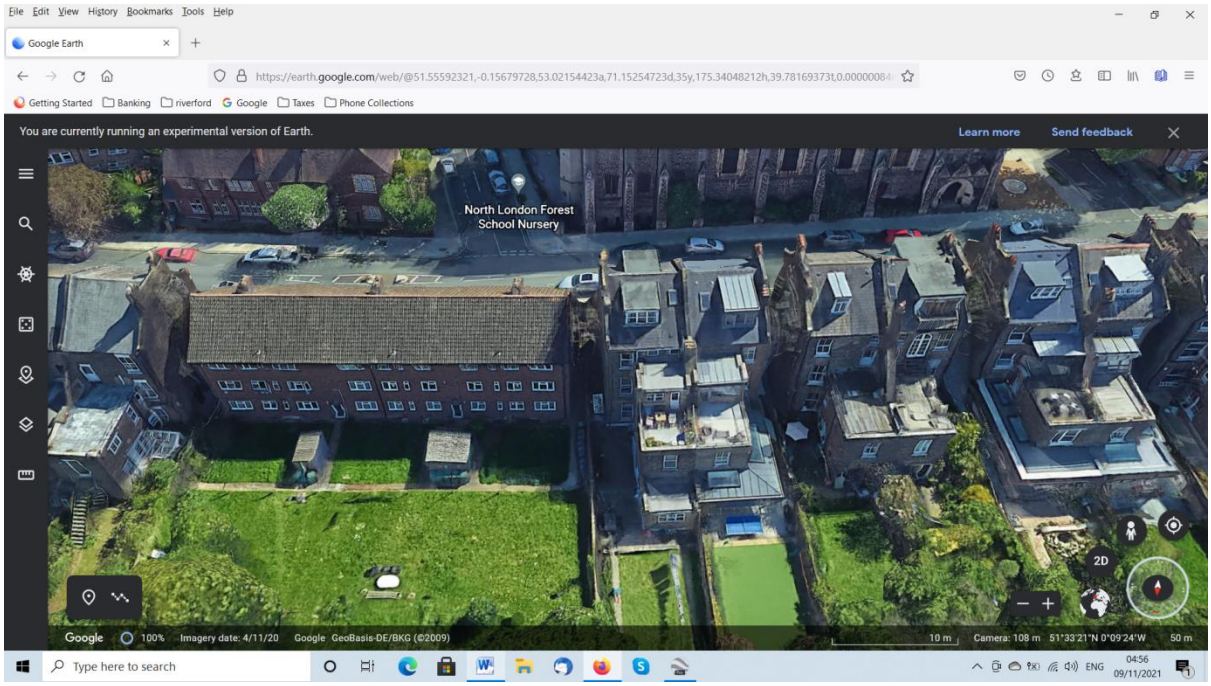
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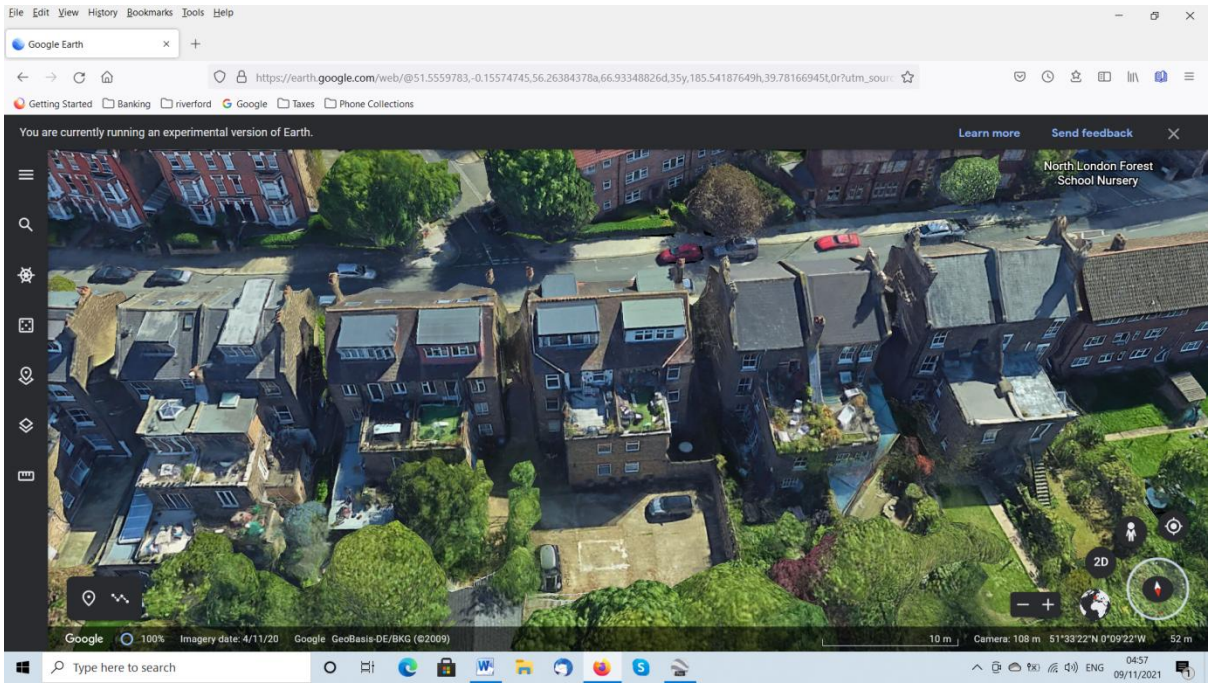
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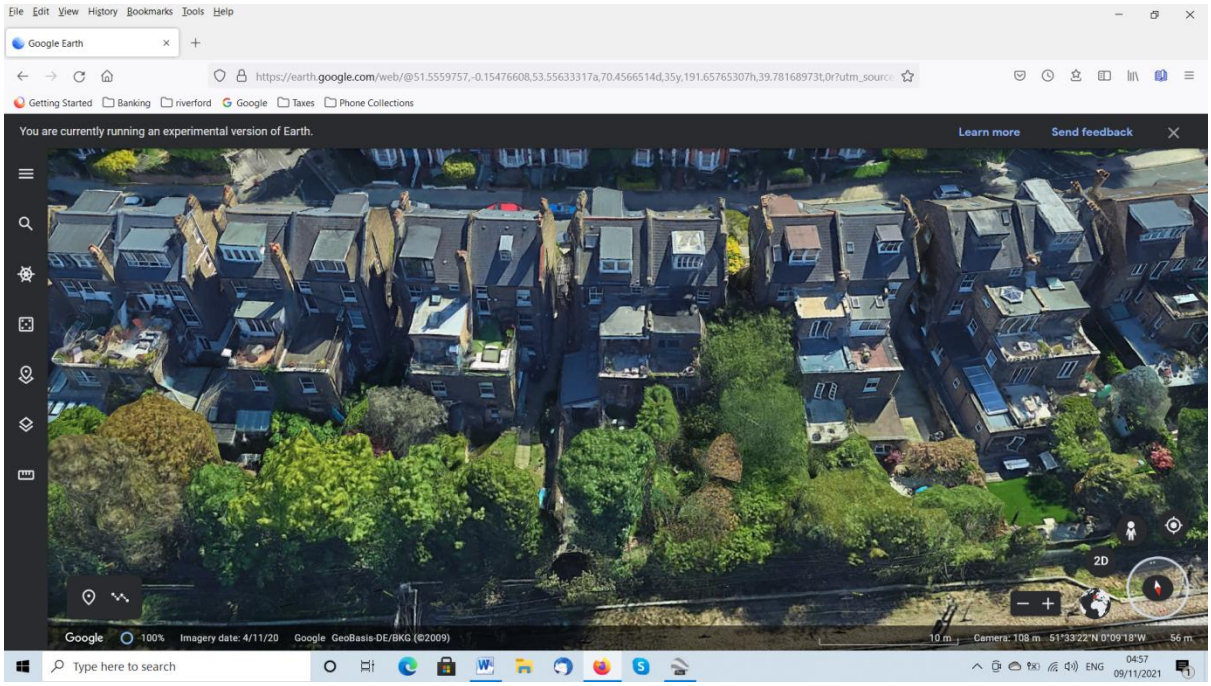
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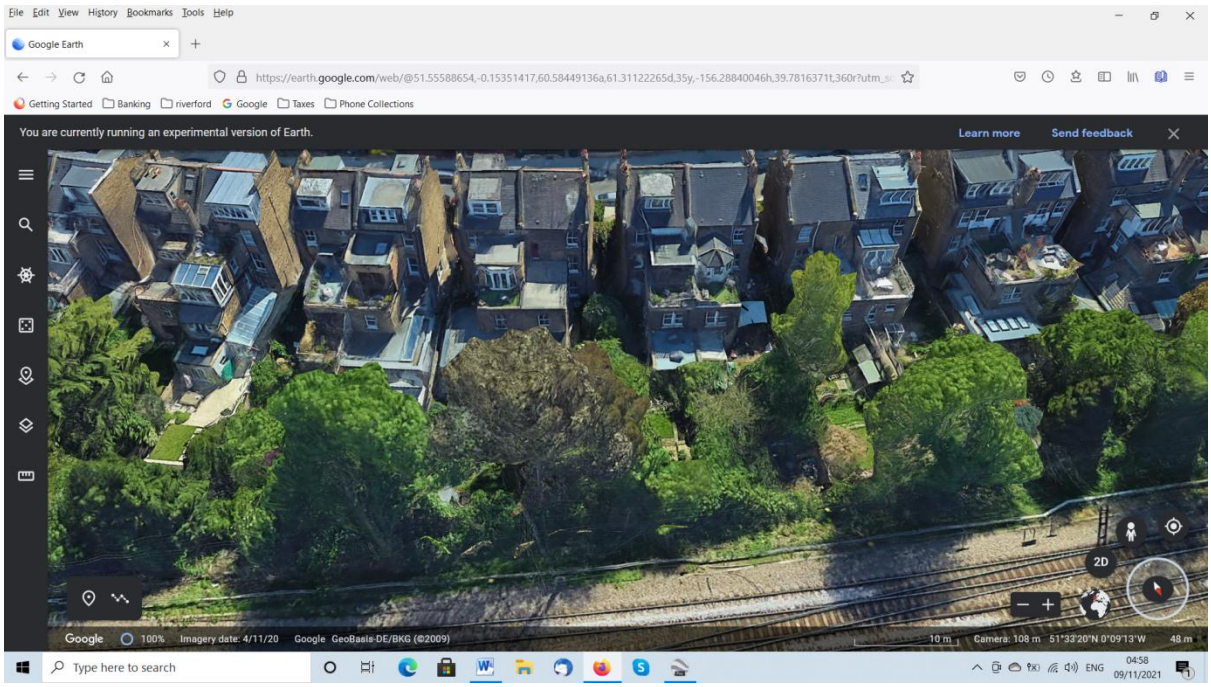
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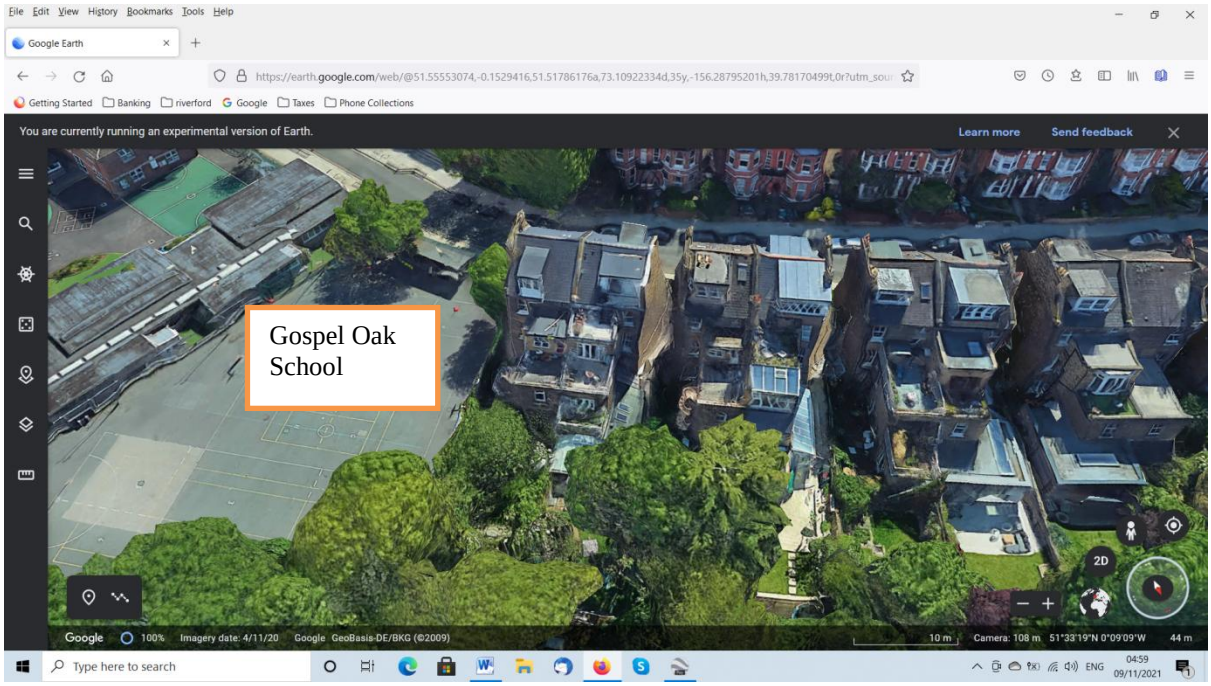
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Appendix 2 Doctors letter

HGP Hampstead Group Practice
www.hampsteadgrouppractice.co.uk

Hampstead Group Practice
75 Fleet Road
London
NW3 2QU
Tel: +44 20 7435 4000

16 November 2021

To whom it may concern

Re: **Mr Bretislav Borak D.O.B: 02-Mar-1946**
87 Constantine Road, London, NW3 2LP
Tel Number: 02074853176 Mobile: 07906377379 NHS Number: 406 027 7444

Mr Borak has asked for this letter to make you aware of and to outline his main medical conditions.

Mr Borak's medical history includes ischaemic heart disease, type two diabetes mellitus, claudication (narrowing) of the vessels in the legs, hypothyroidism and hypertension. Mr Borak suffered from a myocardial infarction (heart attack) in 2016, which was treated with multiple stents. Mr Borak received treatment for a deep vein thrombosis (clot in the leg) in 2013.

Kind Regards,

ALNAJAR, Sara (Dr)
Salaried GP
GMC 7474409

NHS Camden

Appendix 3 View from dormer at No. 85 Constantine Road Photo 1 of 1

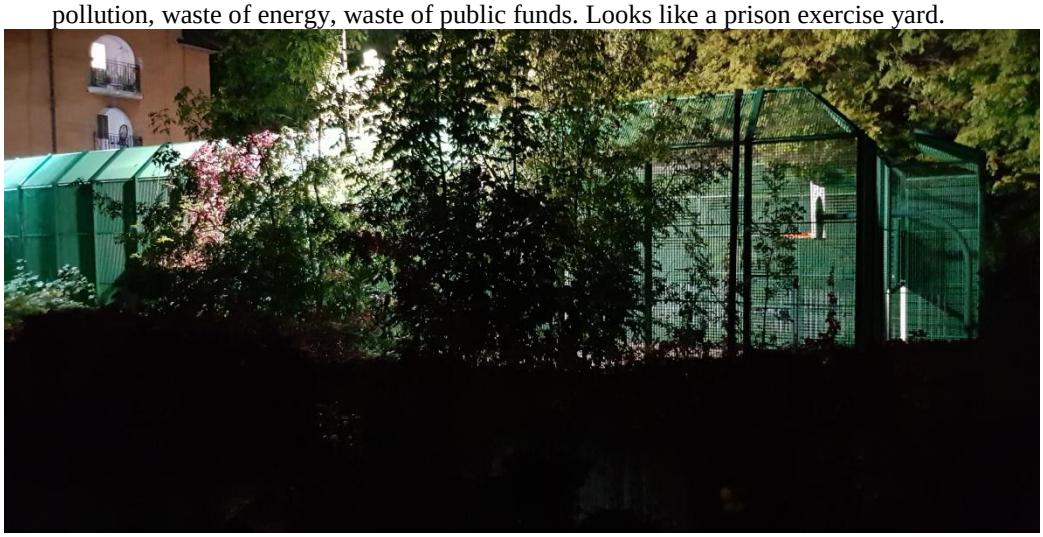
View from dormer of No. 85 Constantine Rd. Note top of Overground Carriage below line of sight.

Appendix 4

Four views towards basketball court at the end of the garden at 87 Constantine Road during the day.

Hideous

View towards the basketball court at night, lights blazing every night - no occupants – light pollution, noise pollution, waste of energy, waste of public funds. Looks like a prison exercise yard.



INTIMIDATIN G!

Appendix 5

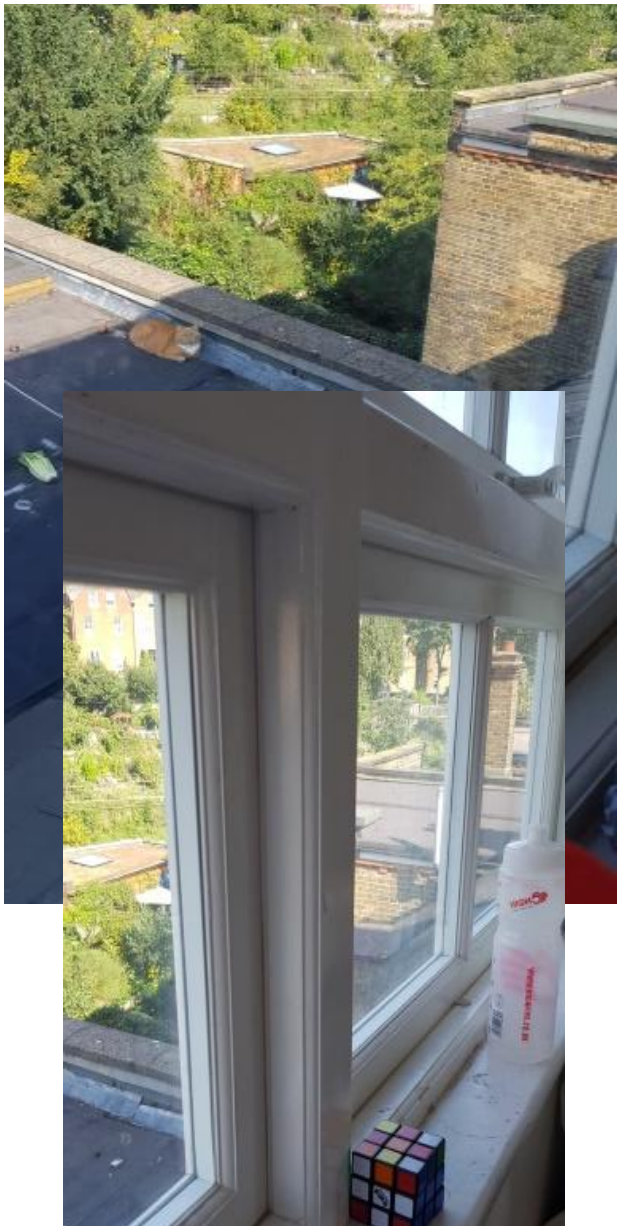
5 Photographs of rear of houses along South Hill Park showing full width dormers

Appendix 6

2 Photographs showing dormers and added storey houses on Tanza Road

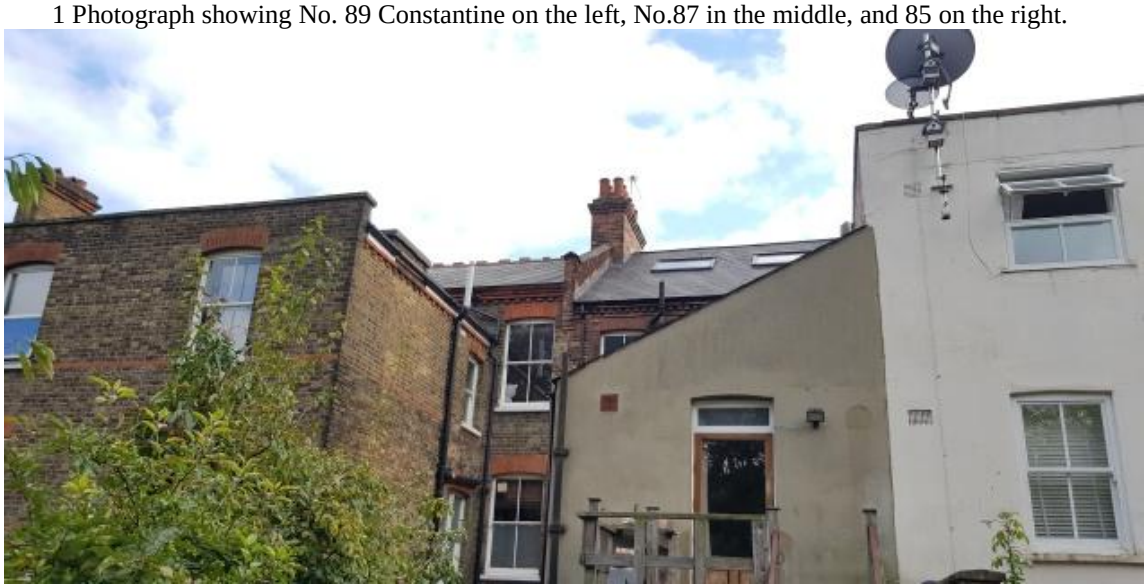
Appendix 7

Two views from the dormer window of no.85 Constantine Road. As can be seen, only the end of the proposed terrace of No. 87 would be seen.



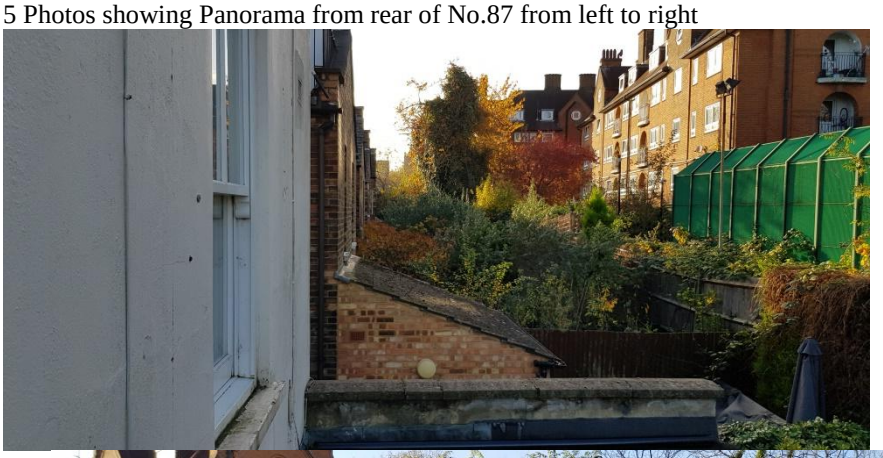
Appendix 8

1 Photograph showing No. 89 Constantine on the left, No.87 in the middle, and 85 on the right.



Appendix 9

5 Photos showing Panorama from rear of No.87 from left to right



Appendix 10

One photograph showing windows of No. 89 at night

Appendix 11

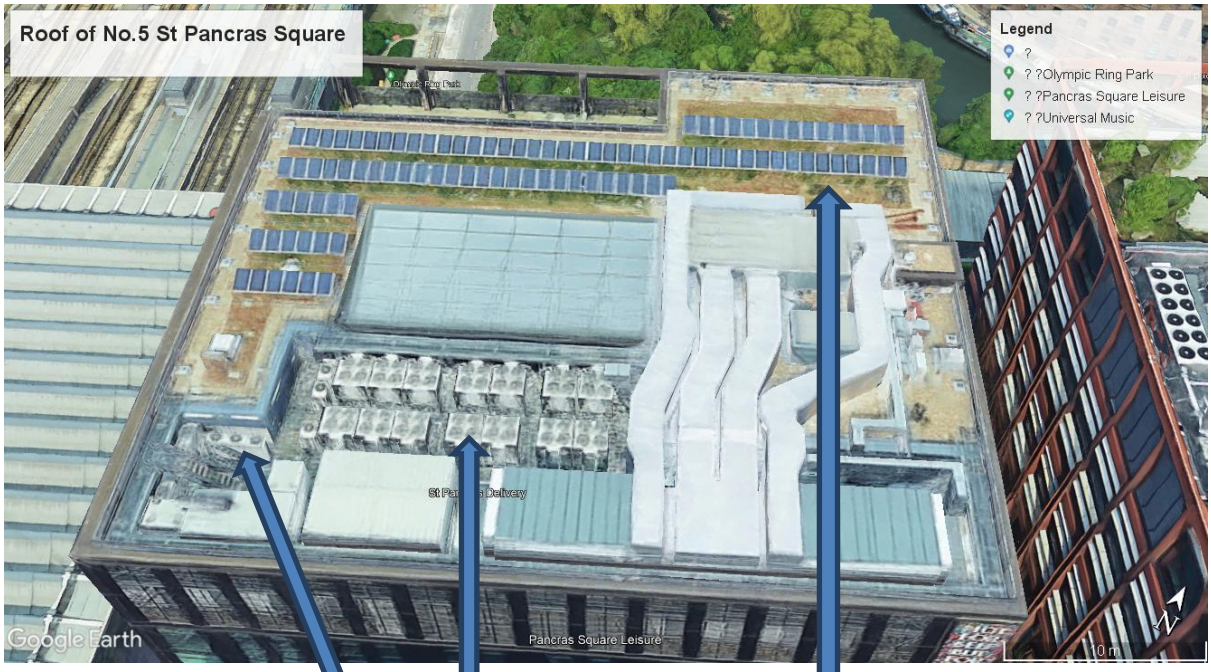
1 photograph of the sliding doors to the ground floor of No. 85

Appendix 12

1 photograph of the Solar panels on the roof of No.145 Constantine Road

Appendix 13

1 Satellite photograph of roof of 5 St. Pancras square

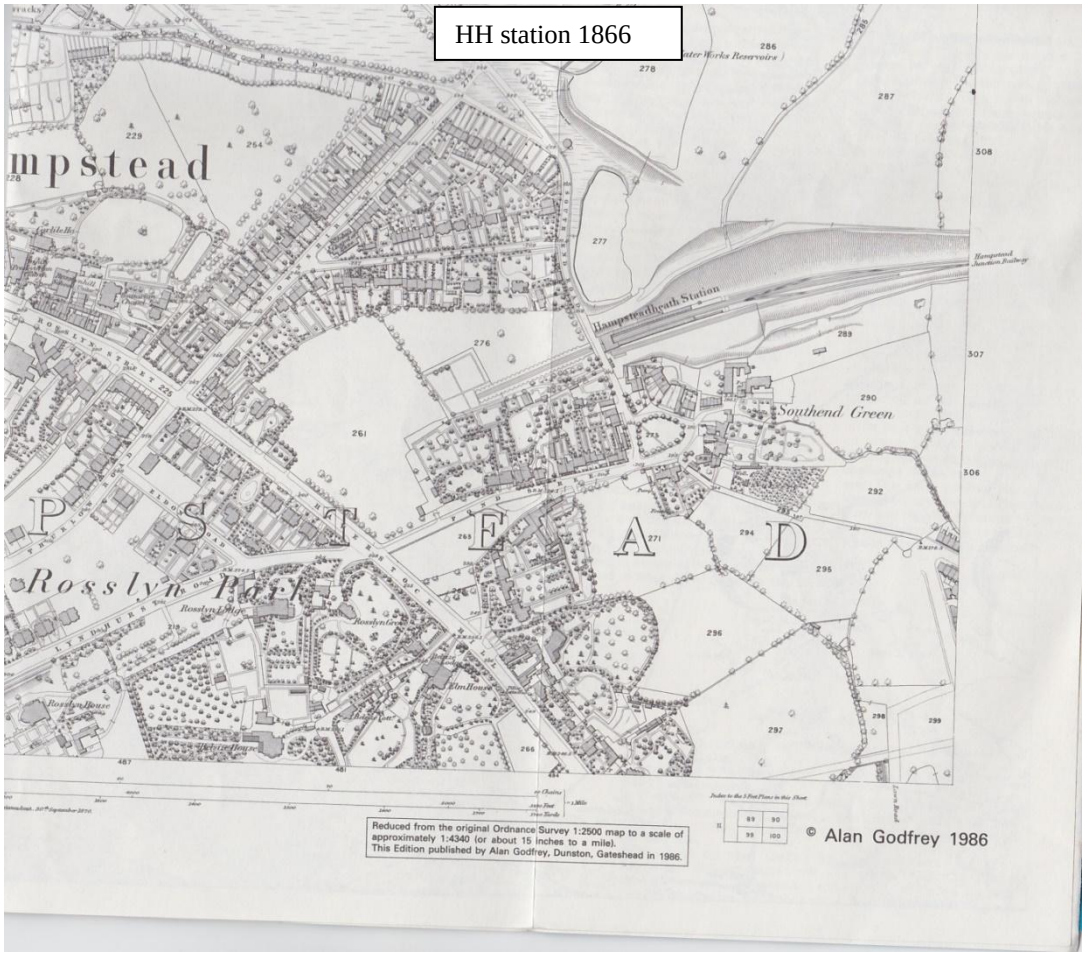


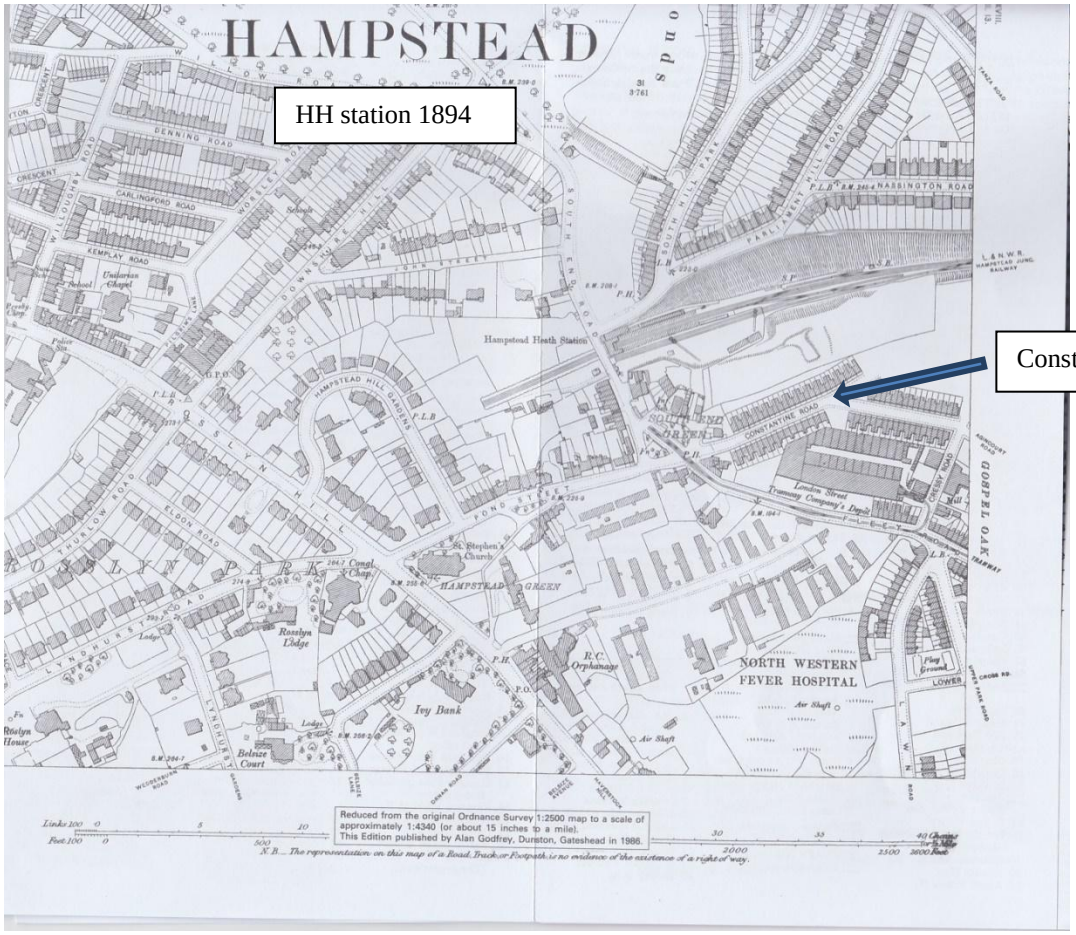
Heat Exchangers/fans

Withered grass roof ineffective for intended purpose. Grass roof is a Camden recommendation for my roof.

Appendix 14

Two scans of historical ordinance survey maps of Hampstead Heath Station




HAMPSTEAD
HH station 1894
Constantine Road
Hampstead Heath Station
CONSTANTINE ROAD
SOUTH END GREEN
HAMPSTEAD GREEN
St. Stephen's Church
NORTH WESTERN FEVER HOSPITAL
R.C. Orphanage
Ivy Bank
Rosslyn Lodge
Belsize Court
GOSPEL OAK
Reduced from the original Ordnance Survey 1:2500 map to a scale of approximately 1:4340 (or about 15 inches to a mile).
This Edition published by Alan Godfrey, Durston, Gateshead in 1986.
N.B.—The representation on this map of a Road, Track or Footpath is no evidence of the existence of a right of way.

Appendix 15

Research Paper on the effects of LED lighting

Milan in Italy replaced sodium street lighting with blue-rich white LED sources. City-centre illumination now looks brighter and bluer than in the suburbs.

Make lighting healthier

Artificial illumination can stop us sleeping and make us ill. We need fresh strategies and technologies, argues **Karolina M. Zielinska-Dabkowska**.

Life on Earth evolved in day-and-night cycles. Plants and animals, including insects such as the fruit fly, have a biological clock that controls their circadian rhythms — as the 2017 winners of the Nobel Prize in Physiology or Medicine showed. Now, humans' increasing reliance on artificial lighting is changing those rhythms[1].

For more than a century, incandescent light sources served us well. These bulbs were cheap to produce and dispose of, and easy to dim. Their spectrum is continuous and includes most of the colours of the rainbow, much like a sunset (see 'Light-source spectra'). They had their problems. In the 1990s, some researchers blamed electric illumination for changing our sleeping patterns from the natural rhythm of two four-hour phases broken by an hour of wakefulness, to a single eight-hour phase each night. Incandescent lamps are energy hungry and policymakers worried about their contribution to global warming. In 2005, lighting consumed around one-fifth of the world's energy.

In 2009, the European Commission began to withdraw incandescent lamps from the European market. Other countries followed, from Switzerland and Australia to Russia, the United States and China. Low-energy lamps — at first mainly compact fluorescent lamps (CFLs) and later light-emitting diodes (LEDs) — have been promoted as replacements. The health risks this policy poses to humans, animals and plants have yet to be thoroughly assessed.

As a lighting researcher and designer, I am convinced that the costs of this transition far outweigh the benefits for human health and the environment. Because the world's urban population spends more time indoors under artificial lighting than in daylight, the health impacts are already evident. Around one billion people globally lack vitamin D or do not have enough[2]. Seasonal affective disorder, a type of depression that can occur in winter when

there is less natural daylight, is on the rise. Shift workers face increased risks of cancer[3], obesity[4] and sleep problems[5].

Biologically benign forms of energy-efficient lighting are needed. I call on physicists, engineers, medical experts, biologists and designers to develop them. Policymakers, planners and regulators should rethink standards, encourage the use of natural light and minimize the negative impacts of artificial lighting at night, indoors and out.

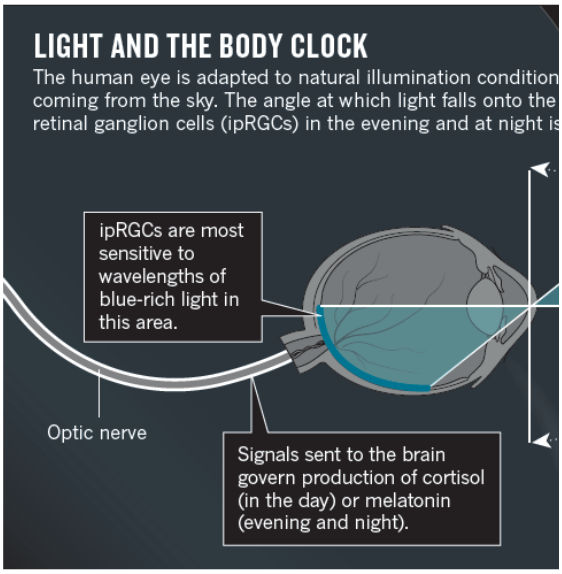
SPIKY SPECTRA

In my view, there is now enough evidence to conclude that the first wave of low-energy light sources is harmful. CFLs are most hazardous. They contain mercury, a neurotoxin. There are no protocols for recycling or disposing of them — 80% are thrown into landfill. Ultraviolet light can escape from defective tube coatings to burn skin or damage the retina at close range; the US Food and Drug Administration recommends coming no nearer than 30 centimetres to a CFL for more than an hour a day.

CFLs have 'spiky' rather than smooth spectra: they emit only certain blue, green and orange-red frequencies (see 'Light-source spectra'). Their flickering at 100–120 hertz can cause headaches and eye fatigue[6]. The energy savings may be overestimated — CFLs take minutes to warm up, so are likely to be left on for longer. When switched on and off many times, they fail more quickly.

Solid-state lighting in the form of LEDs is more promising. LEDs do not contain mercury and produce only a small amount of UV (compared to CFLs or even incandescent lamps). They are more energy efficient, brighter and more long-lived than CFLs. Unlike CFLs, they can be dimmed or tuned and render colours well. But LEDs have downsides[7]. Some contain heavy metals such as nickel, lead and copper, and poisons such as arsenic. Again, there are no special programmes for recycling or disposing of them. Poor-quality LEDs can also flicker and produce stroboscopic effects, such as trails of lights that can confuse pedestrians, cyclists or car drivers.

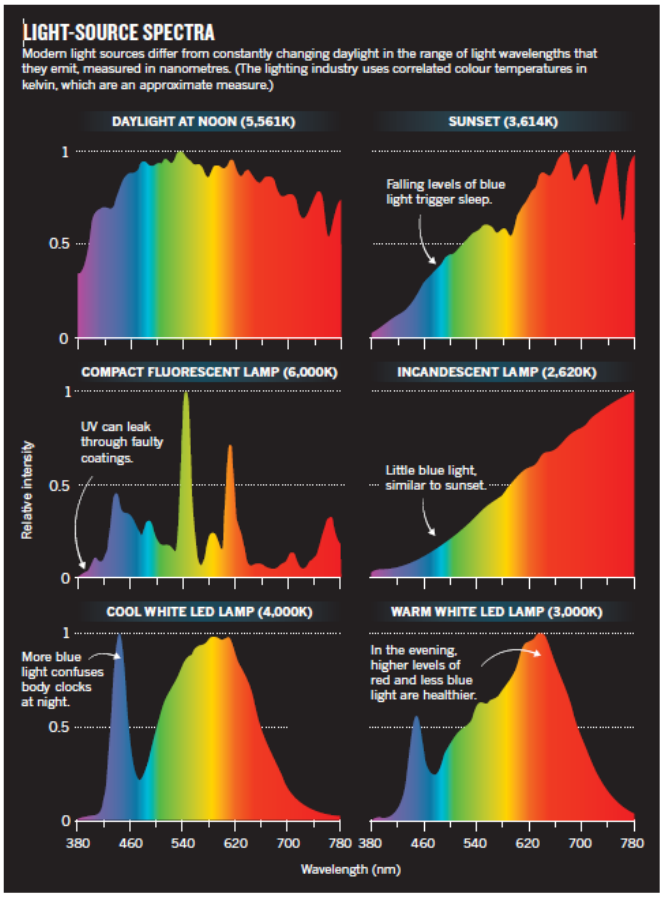
The lighting industry is beginning to address the lack of daylight in indoor spaces. In recent years, it has promoted artificial, biologically effective lighting in office and home environments, known as human-centric or circadian lighting. This promises to adjust people's daily rhythms in indoor spaces, using LED colour-changing lights that mimic daylight according to the time of the day. The German Commission for Occupational Health and Safety and Standardization (KAN) has issued concerns regarding these practices. The risks of adverse effects remain, because there is still too little understanding of the link between light stimuli and non-visual responses. Research is needed to find out more and to firm up standards accordingly.



BLUE PROBLEM

In the meantime, artificial lighting is in my view becoming a public-health hazard. CFLs and LEDs emit more blue light of short wavelengths than a sunset or an incandescent lamp does (see 'Light-source spectra'). Most white LED lamps are made by coating blue or sometimes violet LEDs with yellow pigment, usually phosphor.

The human circadian system is exquisitely sensitive to the spectrum of light visible to the eye, especially blue wavelengths, and its amount and intensity (see 'Light and the body clock'). As well as rod and cone receptors used for vision, the eye contains cells called intrinsically photosensitive retinal ganglion cells (ipRGCs). These send signals to the brain that trigger the body to produce or inhibit neurotransmitters and hormones throughout the



day[8]. The spectral sensitivity of melanopsin, the photopigment of ipRGCs, reaches maximum absorbance at approximately 480 nanometres, matching the colour of a clear blue sky at noon.
In the morning, waking is helped by blue wavelengths of daylight triggering releases of the neurotransmitters serotonin and dopamine and the hormone cortisol. In the evening, as natural levels of blue light drop and are replaced by dim red light, melatonin hormone is produced and helps us to fall asleep. Complete darkness is needed at night to initiate processes of cell renewal.
When people are subjected to artificial blue-rich white light at night, from screens and electronic devices as well as artificial illumination, the photosensitive ganglion cells in the retina signal the brain to stop producing melatonin. Such disturbances can have wide effects: on sleep and waking cycles, eating patterns, metabolism, reproduction, mental alertness, blood pressure and heart rate, hormone production, temperature, mood patterns and the immune system.

Artificial light at night impacts other species, too. Pollinators such as moths, flies and beetles are attracted to lights instead of focusing on feeding, mating or breeding[9]. Bats alter their feeding behaviour; birds, fish and turtles change their migratory routes; and the growth of trees and plants is affected.

CITY LIMITS

The scale of our exposure to artificial lighting is increasing as cities switch sodium street lamps to LEDs. In the United States, 10% of all street lighting has been converted. New York City is changing all 250,000 of its street lights. Milan in Italy was the first city in Europe to do so on such a scale — and the result can be seen from space. By 2015, the city centre's illuminations were brighter and bluer than those of the suburbs.
Good lighting design can mitigate some problems. 'Light trespass' into living areas, including bedrooms, can be reduced by designing outdoor luminaires that shine downwards or use shields to block stray rays. Street lights can be dimmed using intelligent control systems and wireless networks of motion sensors. The Van Gogh village in the municipality of Nuenen in the Netherlands, for example, lowers its street lights by 80% when there is no activity and turns them up when a pedestrian, cyclist or car approaches, surrounding them with a safe circle of light as they proceed. Intelligent lighting is expensive to install, but the investment pays back quickly: the Nuenen system reduced energy and maintenance costs by 62%.
New problems requiring regulation are emerging as LEDs become widespread. For example, electromagnetic radiation from wireless lighting controls, outdoor LED signs and digital billboards can interfere with mobile phones, aviation towers and medical equipment such as hearing aids or implantable cardiovascular devices[10].

"Healthy lighting design is becoming an important ethical issue that cannot be ignored."

TIGHTER STANDARDS

Until healthier lighting options become available, the following steps need to be taken to reduce potential negative impacts on the circadian clock. In my opinion, CFLs should be withdrawn from sale because of the scarcity of disposal and recycling protocols. LED sources should be regulated more tightly. Indoors, I recommend using warm white LEDs in the early evening (with colour temperatures below 3,000 kelvin and with as little blue light in the spectrum as possible) and there should be no exposure to light at night, or only to light with a spectrum greater than 600 nm (amber, red colour). Lighting should be indirect, flicker-free and dimmable.
Independent research — beyond the lighting industry — is needed into the health and environmental impacts of LED sources, including those with adjustable spectral characteristics, intensity, timing and duration based on the time of the day, evening or night. Emissions outside the visible range must be considered, such as near-infrared radiation (750–950 nm) that is present in daylight and incandescent lamps but not LEDs. Research shows that there needs to be a balance — the use of these light frequencies can repair damaged retinal cells[11] and are necessary. The use of heavy metals in LEDs must be reduced and a process for waste management established. The impacts of control technology in outdoor and indoor spaces must be explored.
Governmental and medical bodies need to draw up stricter regulations and standards for the use of short wavelengths of light at night. In June 2016, the American Medical Association issued a policy statement (Guidance to Reduce Harm from High Intensity Street Lights) to help communities select from the different LED lighting options. Recommendations for light intensity thresholds, timing and duration for indoor and outdoor environments at night are also necessary. It is likewise essential to define the exact spectral characteristics of recommended light sources in nanometres rather than only correlated colour temperatures (CCT) in kelvin. The latter is an approximate measure and cannot accurately describe the light spectrum.
Policymakers should encourage better use of natural light indoors during the day. Artificial light should be used only when there is not enough daylight available, especially in factories, hospitals, nursing homes and offices where people spend a lot of time. Building regulations should reward practices and technologies that harness natural light.
Municipalities should incorporate sustainable night-time illumination polices and guidelines into their urban lighting master plans. Street and security lighting should be directed downwards and shielded. Light levels for walking, cycling and driving should be the minimum acceptable. Passive technologies should be explored. For example, glow-in-the-dark surfaces that absorb energy from the Sun during the day and release it at night could be used on roads and cycle ways (from this low angle, the light would fall on the retinal zone in which blue light has no biological influence). Lights in parks and near forests should be switched off or dimmed late in the evening.
Electromagnetic field emissions from LED outdoor advertisements must be controlled. Digital displays on facades should be no brighter than illuminations on nearby streets, buildings and squares. Installations should be switched off late in the evening to reduce light trespass into residential buildings.

Finally, the public's awareness of lighting issues must be raised. Researchers and lighting practitioners need to communicate the challenges. Healthy lighting design is becoming an important ethical issue that cannot be ignored. An increasing number of communities, such as Monterey in California, are winning lawsuits against municipalities for inappropriate LED city lighting.

For all these reasons, I still use the old incandescent light sources in my home, sleep in complete darkness and spend at least one hour each morning in bright daylight to activate my circadian clock — as do many lighting designers, physicians and chronobiologists. It is imperative that we return to the bright day and dark night cycle that evolution engraved in us. ▪

Karolina M. Zielinska-Dabkowska *is a lighting designer, assistant professor at the Faculty of Architecture, Gdansk University of Technology, Poland, and the International Association of Lighting Designers EU Regulatory Affairs Working Group Member.*

e-mail: k.zielinska-dabkowska@pg.edu.pl

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Appendix 16

Research paper extract

Assessment of visual fatigue under LED tunable white light with different blue components

Yin Zhang SID Student Member1 | Yan Tu SID Member1 |
Lili Wang SID Member1 | Wei Zhang2

Abstract

Light-emitting diode (LED) light source has high intensity emission of blue components absent in the daylight spectra and regulates human physiology and behavior. The aim of this study was to explore the effects of LED tunable white light with different blue-component intensities on visual fatigue based on human eye photoreceptors. The short (S)-cone and melanopsin illuminance were about 212% and 82% higher for blue-enriched white light than blue-less white light, respectively. The photopic illuminance was same for these two lights. The results revealed that blue-enriched LED tunable white light with higher illuminance of S cones had a significant effect on visual fatigue. Participants experienced more eye discomfort under blue-enriched white light accompanied with decreased vision function and changes in the autonomic nervous system. Visual acuity and tear film stability declined, and heart rhythm changed more significantly under blue-enriched white light than blueless white light. While memory performance did not decline with more severe visual fatigue, improved memory performance under blue-enriched white light may be due to enhanced alertness or arousal associated with high melanopsin illuminance. Our results suggest that blue-enriched white light with higher illuminance of S cones and melanopsin has beneficial effects on cognitive performance, but it can induce relatively more visual fatigue.

CONCLUSION

The present study adopted photoreceptor-specific illuminance to characterize the blue component of LED tunable white light and attempted to find mechanisms that influence visual fatigue from LED blue components.

Therefore, based on photoreceptor-specific illuminance, the effects of blue-enriched and blue-less white light on visual fatigue were investigated. Among five photoreceptor illuminances, the main differences between blueenriched and blue-less white light were S-cone and melanopsin illuminance. Our results revealed that for LEDs tunable white light, the blue-enriched white light with higher illuminance of S cones had a great effect on visual fatigue. Participants felt more uncomfortable in their eyes, and the vision function CFF and BUT decreased more after the 1-hour visual task under blue enriched white light than blue-less white light. Meanwhile, the ANS was also changed significantly with LF power and LF/HF increasing and HFn and FuzzyMEn decreasing. The results suggest that the blue component of LED white light, mainly perceived by S-cone photoreceptor, has a great effect on the ocular symptoms, vision function, and ANS, which are the manifestation of visual fatigue. It is noticeable, however, that the memory performance was different from visual fatigue and increased under blue-enriched white light. This is possibly due to the higher alertness or arousal of blue components with higher melanopsin illuminance. Therefore, some compromises between cognitive performance and visual fatigue should be made when considering the effects of blue components for LED spectral optimization. The different effects and nteractions

between melanopsin and S-cone illuminance still need to be studied further as both are sensitive to blue components and influence human functioning. More lighting conditions with different spectral characteristics need to be studied further.

ACKNOWLEDGMENT
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Appendix 17

Magazine article www.downtoearth.org.in 53 16-31 AUGUST 2017

H E A L T H

Shadows of LED

Exposure to LED lights could be harmful.
Scientists suggest a simple solution

MEGHA PRAKASH

Exposure of the retina and lens to blue peaks from LED lights can increase the risk of cataract and age-related macular degeneration

LIGHT EMITTING diode (led) lights are becoming popular in India by the day as they are less expensive and more efficient. The Indian led lighting market was worth US $3.7 billion in 2016 and the sector grew by 17.5 per cent between 2009 and 2016. But their health impacts have been largely out of public domain. In 2016, the American Medical Association (ama) said that led technology may impact human health. Led lights emit light from the short-wave, high-energy blue and violet end of the visible light spectrum. This light range controls our sleep cycle and correct exposure is important to maintain our circadian rhythm. Little wonder that many people complain of itchiness, redness in the eyes and mild headaches after continuous exposure to led lights. The ama says that lifelong exposure of the retina and lens to blue peaks from leds can increase the risk of cataract and age-related macular degeneration.

Studies also reveal that light emitted by leds can cause retinal changes, if there is high exposure for even a short period of time. A 2014 study published in *Environmental Health Perspectives* reported the adverse effects on the retina of rats due to chronic exposure to led lights compared with other light sources that have less blue light. These researchers suggested a precautionary approach with regard to the use of bluerich "white" leds for general lighting. Satya Karna, a consultant neuro-ophthalmologist with the Narayana Nethralaya, Bengaluru, says the lens and cornea have inherent ultraviolet light blocking, but with age some light, including blue peaks, can reach the retina and cause damage. A study, which will be published in *Vision Research* in September this year, suggests that led lights can cause headaches as they flicker too much. Compared to fluorescent lights which dim by around 35 per cent with every flicker, led lights dim by 100 per cent. This can cause headaches by disrupting the movement control of the eyes, forcing
the brain to work harder.

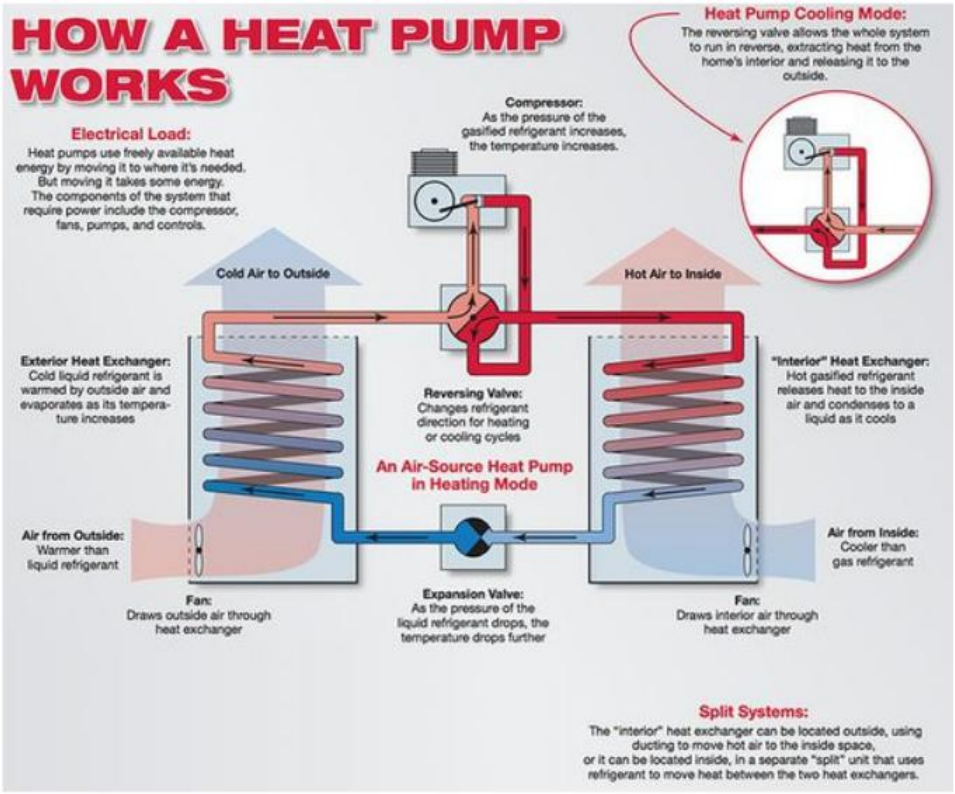
Innovation at hand

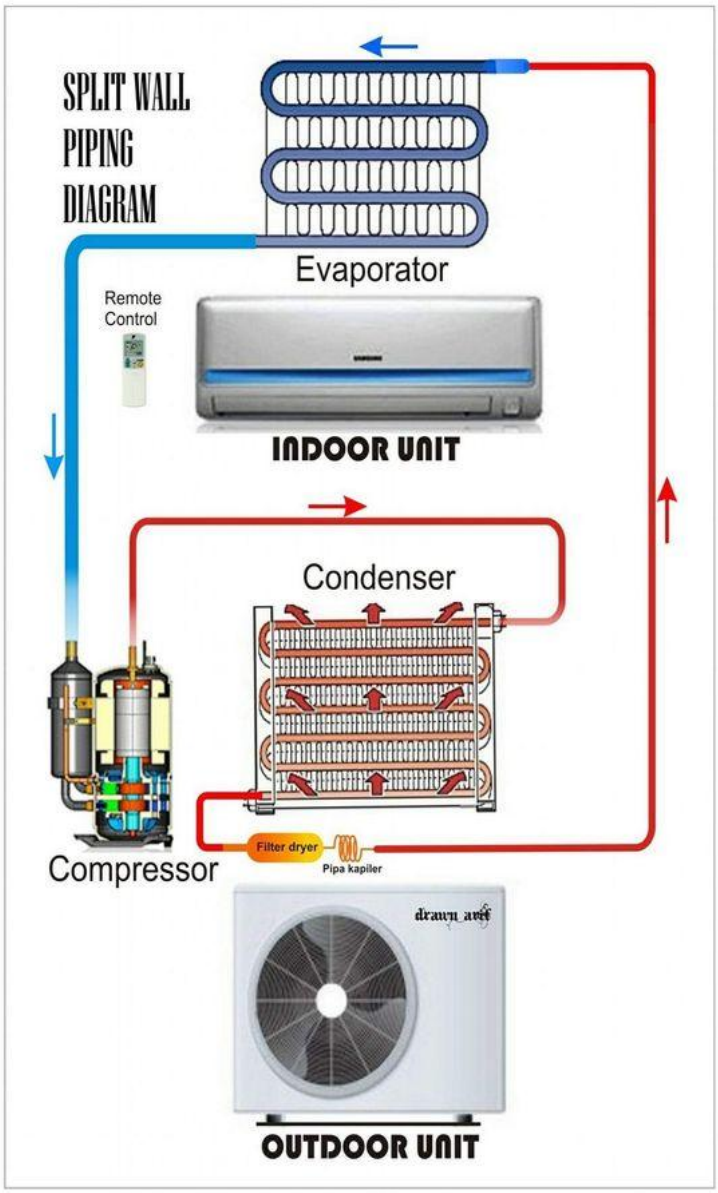
Monto Mani, an associate professor at the Indian Institute of Science's (iisc's) Centre for Sustainable Technology in Bengaluru, had a tryst with led lights not so long ago. "While working with fine artwork/tools under led lights, my students complained of intense eye strain and a diminished clarity.

On one occasion, while working under led lights for about 20 minutes, I developed an uncharacteristic pain in the upper part of the eye (ball) which nearly lasted till the next morning. We then decided to find a solution to the problem," says Mani. Mani and his team tested most of the commercially available led luminaire with a spectroradiometer and found the blue peak to be unnaturally high and very unlike the natural indoor light. Finally, through some quirk of intuition, Mani tested the lights after applying Kapton tape, a polyimide film that can remain stable across a wide range of temperatures. "To everyone's delight, it did the job so well that one would even be convinced that these tapes were developed only to cut the blue peak. So much so, that our lab has all our led lights with Kapton, and everyone who visits our lab feels that these lights feel good," says Mani. In light of the harmful effects of these radiations, many manufacturers are taking a serious note of blue peaks from leds and are moving towards warmer leds without the blue peaks. Most warm led lights, 4,000 K and even 2,700 K, still emit an uneasy blue peak, but are much subdued from the cool daylight 6,000 K variants. Experts recommend the blocking of blue light in the 415-455 nanometres (nm) spectrum in led lighting for commercial use. Experimental evidence indicates that exposure to blue light in the range of 470–490 nm may be less damaging to the eye compared to blue light in the 400–460 nm range.

Experts say that the development of leds with a peak emission of around 470–490 nm may represent an important advancement in the safety of leds for ocular health. As led lights are spreading rapidly in India, it is imperative to review their health impacts. This is also because many government programmes are pushing led lighting, including the Union government's Prakash Path programme, launched in January 2015 for efficient domestic lighting. There is a national programme for led-based home and street lighting, and the Bureau of Energy Efficiency (bee) too has launched a nationwide campaign under which led lights will replace the incandescent bulbs to promote energy-efficient lighting. But for the common consumer, it may be wise to replicate Mani's innovation. As he says, "We wanted to empower the common man with a simple and cost-effective diy (doit-yourself) technique to render the currently available lighting, as well as those who have already purchased and installed, safer for human (and wildlife) eyes." iisc has, in fact, implemented Mani's application for lighting up the campus and positive feedback is pouring in. @down2earthindia

The team from the Indian Institute of Science, Bengaluru, which developed a method to block the blue peaks from LED lights




SPLIT WALL
PIPING
DIAGRAM
Evaporator
Remote
Control
INDOOR UNIT
Condenser
Compressor
Filter dryer
Pipa kapiler
OUTDOOR UNIT

Confirmation of Design Intent:
The Freeholder, Bill Borak, would like to remodel, extend and enhance the maisonette flat 2 on the first, second and third/roof floors. Improve daylight transmission throughout the property accommodation. Also incorporate sustainable design strategy with the introduction of photovoltaic cells providing property power/storage and split unit air conditioning with heat pumps for flat 2 accommodation.

The enhancements take into account the Mansfield Conservation Area criteria in the following ways:
Modern design elements of the 21st century added to the rear additions of the property which address and respond to the form and quality of the surrounding properties and spaces.
Quality materials and detailing are to be used and incorporated with modern design elements/components.

Flat 2
The original two storey rear addition is added to create a new three storey rear addition type which exists to no. 85 and no. 89. The addition does not diverge from the historic pattern to the character of the area.

The third floor/roof space increased by the addition of a full width glazed dormer to increase habitable accommodation and provide rear access onto a small decking area with a pebbled pathway to the new astronomical observation decking area within a new wild flower and herb garden flat roof terrace. The terrace is enclosed with a low parapet wall with 60 degree angled pervoskite panels over to provide safe/protected guarding. The angled guarding system design prevents any overlooking issues to the rear terrace sides. The double glazed roof lantern full width to the boundary of no. 85 provides daylight to the maisonette flat 2 new living room accommodation under also prevents any overlooking issues to no. 85.
The rear roofs of the Constantine Road properties incorporate every variety of roof dormer designs all as viewed in the photographs and videos on the Over-ground journey from Gospel Oak to Hampstead Heath stations. The rear Constantine Road roofs are all altered so the proposed development at no. 87 does not undermine any uniformity of the terrace rear roofline.

Maisonette Flat 2 on the first, second, third/roof floors remodelling, extensions and enhancements comprise:
The property main staircase 1 finishes upgraded to the first floor maisonette flat 2 entrance.

First Floor - New glazed internal flat 2 entrance door and glazed screen. The existing front kitchen is changed into a Utility room. The existing rear addition bathroom and bedroom 3 remodelled to create new bathroom, kitchen and dining with new side windows. The existing rear balcony platform is retained with access from the new kitchen /dining accommodation through new glazed sliding double doors to maintain access from Flat 2 to the rear garden.

Second Floor – New rear third floor addition to the existing rear two storey addition created for the new bathroom and living room accommodation, new side windows with new glazed sliding double doors with Juliet balcony to the end fenestration. The

two existing bedrooms retained. New staircase 2 incorporated from hallway 2 leading up into the new third floor/roof accommodation

Third Floor – New dog leg staircase 2 introduced from the second floor landing connecting the third floor new Master Bedroom 5, new Ensuite accommodation, new storage with new full width rear glazed dormer addition. The full width dormer has fixed glazing with sliding glazed double doors (only one slides at a time) leading out to the small decking platform, pebble pathway leading to the new astronomical decking platform and new wild flower, herb garden green flat roof system. The green flat roof has a low parapet enclosing wall over with 60 degree angled perimeter perovskite guarding/panels. The new flat roof incorporates a new longitudinal glazed skylight over the new second floor living room accommodation adjacent to the raised parapet wall to no. 85.

Proposed new maisonette Flat 2 accommodation areas:
Maisonette Flat 2: Total gross internal area of 182.3 sq metres

First floor
Hallway area 16.9 sq metres
House stairs 1 area 2 sq metres
Utility area 4.5 sq metres
Bedroom 1 (front) area 15.3 sq m
Bedroom 2 (rear) area 10.4 sq m
New Bathroom area 3.5 sq metres
New Kitchen/Dining area 12.2 sq metres
Existing Balcony Platform area 4 sq metres
Shared Rear Garden area 72.5 sq metres
Maisonette Flat 2 first floor area 64.8 sq metres

Second floor
House stairs 1 area 0.5 sq metres
Hallway 1 area 4 sq metres
Hallway 2 area 2.2 sq metres
New House stairs 2 area 1.3 sq metres
Bedroom 3 (front) area 18.2 sq metres
Bedroom 4 (rear) area 10.4 sq metres
New Bathroom area 3.6 sq metres
New Living room area 13.2 sq metres
Maisonette Flat 2 Second floor area 51.9 sq metres

Third floor/roof
New House stairs 2 area 2.5 sq metres
New Bedroom useable area 25 sq metres
New Ensuite area 5.2 sq metres
New Storage area 18.2 sq metres
New wild flower and herb garden, decking platform, pebble pathway and astronomical decking platform green roof terrace area 14.7 sq metres
Maisonette Flat 2 Third floor/roof area 65.6 sq metres

Roof
Pitched roof (front) existing blue slate pitched roof
Existing 2no. roof-lights front roof retained
Pitched roof (front) New photovoltaic cell system, 14 panels fixed over blue slates
Pitched roof (rear) ridge tiles and part retained existing blue slate pitched roof
New zinc clad dormer full width
New photovoltaic cell system, 10 panels fixed over new zinc clad dormer roof

Proposed Materials:

Existing rear addition first floor to maisonette flat 2:
Existing exterior enclosing walls to side and rear shall have a new red coloured insulated rendered system finish applied.
New anthracite coloured proprietary bottom hung 2no.windows installed to the side yard fenestration with new sliding double doors system to the end fenestration.

New rear second floor addition to maisonette flat 2:
New wall fenestration comprises new external red decorated insulated render system, blockwork, insulated cavity, blockwork internally plaster finished enclosing wall.
New anthracite coloured proprietary bottom hung 2no.windows installed to the side yard fenestration with new sliding double doors system to the end fenestration.
with new Juliet balcony decorative glazed screen.

New rear third floor/roof dormer addition to maisonette flat 2:
New full width rear double glazed dormer, anthracite coloured fixed glazing and double sliding glazed door with enclosing end walls matching red brick masonry finished internally with insulated dry lining system. Natural finish zinc cladding to dormer facade soffit and roof. 10no. photovoltaic cell panels located over the new zinc finished dormer sloping down to the property main roof.

New rear flat roof terrace over new rear addition to maisonette flat 2:
New wild flower and herb garden, decking platform, pebble pathway and astronomical decking platform green roof terrace
New perimeter perovskite guarding/screen set at 60 degrees above the new enclosing parapet walls. The new parapet walls comprise new external red decorated insulated render system, blockwork, insulated cavity, blockwork render finished enclosing wall.
New zinc capping to top of the new parapet wall.
The new flat roof incorporates a new longitudinal glazed skylight with anthracite coloured glazing bar system against the parapet wall to no. 85.
New split air conditioning unit consoles serving flat 2 second and third floors accommodation.

Existing front pitched roof to property:
14no. new Photovoltaic cell panels introduced, centrally located over the retained existing blue slate roof.