

Applicants' note to the Planning Sub-Committee

**Re: 2023/0971 and 2023/0973: 53 Northchurch Road, London, N1 4EE**

## **Background**

The Planning Sub-Committee's April agenda includes further consideration of an application for PP and LBC to install solar panels on the south- and east-facing roofs of the property.

At its meeting on 6 December, following a lengthy and detailed discussion, the Sub-Committee voted against the planning officer's recommendation that the application be refused on heritage conservation grounds.

The Sub-Committee deferred the application and requested that we provide a Retrofit Plan, so that it could satisfy itself that installation of solar panels is the most sensible next step.

## **Retrofit Plan**

A copy of the plan is attached. The assessment was carried out, and the plan prepared, by an accredited retrofit assessor in accordance with PAS 2030.

Due to the Listed status, the retrofit measures available are restricted, but as the report confirms, all key available steps of a 'fabric first' approach have already been implemented.

The Retrofit Plan recommends, in Phase 1, installation of solar panels in accordance with the application, and identifies this measure (and installation in due course of an air source heat pump) as "the most impactful improvements".

As to the other recommended Phase 1 measures:

- installation of a boiler compensator: we are investigating compatibility with our existing boiler;
- draught-proofing of lobby door: this is in hand.

## **The issue for decision**

The Retrofit Plan demonstrates conclusively that the installation of solar panels is the most appropriate next step, and that it produces very significant CO<sub>2</sub> savings. We therefore request the Sub-Committee now grants the application.

## **Attendance at the April meeting**

Regrettably, we cannot attend the April meeting in person. We will ask for permission for our architect, Bernard Tulkens, to speak at the meeting so that he can answer any questions that the Sub-Committee may have.

**Stephen Grosz and Vicki Chapman**

**March 2024**



## **Whole House Retrofit Plan for 53 Northchurch Road N1 4EE**

Prepared by Melissa Susan Merryweather  
Architect, DEA, Retrofit Assessor, Retrofit Coordinator (Trustmark),  
BREEAM AP, HQM Assessor

### **General Notes**

The Medium-Term Plan is the agreed step by step Retrofit Plan laying out the key renovation steps for this property.

The Plan should be updated when key steps are carried out. Ideally each renovation step is monitored by the RC. When the first measures are implemented, plan and measures can be lodged on the Trustmark website.

### **Consents**

This property is Grade II listed and sits in a Conservation Area. Ensure all measures are either permitted for this property, or that relevant Planning permissions are awarded prior to carrying out any work, as well as notifying Building Control and ensuring that the work meets any relevant building Regulations, including Part L and Part F. Note that in the case that work is deemed Permitted Development it is recommended to obtain a Permitted Development certificate to prove its validity at the time of installation.

### **Measures not included in the Medium-Term Plan**

- Double-glazing has been installed throughout with the exception of a small window in the entrance lobby. The double-glazing is high-quality and being post-2002 is not recommended for replacement.
- Timber shutters are installed in many of the existing windows, offering further reduction of heat loss.
- Insulated drylining has been installed to two rooms in the rear extension where there are no period features, and according to listed building consent granted in 2009.
- Otherwise, internal insulation for the main house has not been recommended for the following reasons:
  - Risks related to thermal bridging due to the complexity of junctions
  - A whole-house mechanical ventilation system must be installed to compensate for reduced natural ventilation. This poses issues related to installation of ducting.
  - Cost of insulation shown in the spreadsheet is based on a simple unit cost for installation of the materials and plaster skim coat and does not include removal and replacement of kitchen, bathrooms

and other internal decorations, nor extra costs to the occupants during work on site. Cost will be significantly increased and payback reduced.

- External wall insulation contravenes planning guidelines for grade-listed properties.
- Underfloor insulation did not show a benefit for this property.
- Hot Water Waste heat recovery is not suitable for a household with low occupancy.
- Smart TRVs are already installed throughout to lower gas consumption. The efficient gas boiler is in good working order.

## Medium Term Plan

The agreed steps for this property:

**Phase 1:** can be carried out at any time pending any relevant consents.

- Recommended: Install approximately 4 kw solar PV to south (garden/rear)-facing main roof and east-facing main roof as per supplier and architect's recommendations for siting and installation. Include battery support.
  - This measure shows a medium-term payback of 10 years with substantial **energy use reduction of around 3,414 kw equal to 12% of the total energy use of the property.**
  - Individual Solar PV installation increases UK off-grid and/or grid energy supply to meet the UK's Net Zero energy goals.
- Recommended: Install a boiler compensator. This augments the existing range of heating controls (thermostat, smart TRVs and programmer). A boiler compensator can reduce energy for space heating by up to 5%.
- Recommended to draughtproof doors leading from the entrance lobby.
- Optional: Replace existing single glazing to window in the entrance lobby with new double-glazed unit to meet a u-value of 1.4 W/m<sup>2</sup>k or less.
  - This measure shows energy savings of less than 60kw and with an extremely long payback can be considered optional.

## Phase 2:

- Existing loft insulation is in moderate repair. Cost to upgrade is increased by boarding installed over the insulation. Recommend to inspect loft insulation periodically and replace/upgrade should the material degrade significantly. Aim for around 250-300mm of high-loft insulation or replace with compressed insulation to achieve a u-value of 0.16 W/m<sup>2</sup>k.
- Upgrade flat roof insulation when flat roof coverings become due for renewal. Meet Part L building regulations for replacement building elements to achieve a u-value of 0.16 W/m<sup>2</sup>k for replacement roofs.

### Phase 3

- Replace existing boiler with an Air Source Heat Pump (ASHP).
  - Timing to be determined by lifespan of existing boiler. Recommended to replace boiler when performance begins to be reduced and/or maintenance costs increase.
  - Ensure until that time that the boiler is serviced annually.
  - Get quotations from retrofit-specialist suppliers.
  - Carry out any upgrades scheduled for phase 2 prior to installing a heat pump, if possible. (Recommended upgrades will make a modest impact on size of heat pump and radiators)
  - Ensure that heat loss calculations and Noise Assessment are carried out prior to engaging a supplier, in order to confirm any changes to radiators and to confirm location and noise will comply with any permitted development or planning restrictions.
  - Ensure that if required, planning consent is granted prior to installation.
  - Underfloor heating can improve heat delivery on the ground floor though energy use will not necessarily be reduced. Any underfloor heating system should include insulation. The whole must comply with listed building requirements.
  - Alternatively, a 100% radiator solution is achievable for this property. An ASHP is best fitted with a dual or smart meter so that lower-tariff energy bands can be applied.

Any interim changes to plumbing layouts for heating or hot water should take into consideration the future upgrade to an ASHP so that future pipework will be minimized.

ASHP models suitable for retrofit come in several popular configurations. These may provide hot water heating in an integrated unit or they may require a separate hot-water cylinder. Radiators may need to be upgraded.

### Ordering of measures and Risk Assessment

The selected phasing and upgrades of all three phases carry only a low level of risk. The risk grade is “C” (highest grade applied) due to the property being listed.

### Ventilation risk

If any condensation or mould becomes visible to the inside of the windows, mechanical ventilation or retrofitted trickle vents should be considered; refer to planning guidance.

If the front lobby window is replaced with double glazing, include a trickle vent if allowed according to planning guidance.

## **Risks for specific measures and additional installation advice:**

**Solar PV:** Planning permission will be required for the solar PV as the building is listed. Buildings in a conservation area can install PV according to permitted development, but listed buildings are not included in permitted development rights. No other risks exist for PV and the panels can be installed at any time as they do not conflict with any other measure.

**Flat Roof Insulation:** The choice of additional flat roof insulation should be made in the context of access and suitability to the existing construction. There are no risks to be considered in the choice of materials. The target u-value can be met by any number of options including compressed board materials.

**Loft Insulation:** The choice of loft insulation will depend on the status of the existing insulation at time of replacement. Ensure that insulation is installed so that there are no gaps around the perimeter of the loft and that any boarding is raised above the insulation so that it is not compressed more than recommended by the manufacturer (some types of insulation are made specifically for over-boarding). Installing a layer of insulation over the roof joists as well as between roof joists ensures better continuity and performance than insulation that is only laid between the joists and is recommended to achieve the desired performance. No material constraints, however, natural materials are preferred due to their lower embodied carbon. Ensure that the loft is well-ventilated. with passive vents at opposite ends of the loft being preferable.

**Underfloor insulation:** UF carries risks if the insulation is being applied in a suspended timber floor context which is the case for this property. Underfloor insulation must be carried out in such a way as to ensure air-tightness between the insulation and the flooring above, but maintaining underfloor ventilation below the insulation. If insulation is laid onto any areas of existing solid floor the risks are substantially less and mainly lie in ensuring no gaps remain between the insulation and existing vertical elements (walls, doors, etc).

**Insulation Generally:** Any upgrades to improve or install insulation should be made prior to installing a heat pump, as far as possible. This is to ensure that the heat pump is sized properly.

**ASHP:** Prior to ASHP installation, ensure that the supplier / installer make comprehensive heat loss calculations. A smart meter is preferable to a standard electricity meter. Include regular maintenance with the contract. Note that certain brands have shown superior performance and servicing than others and have provided installers with specialist training for retrofit contexts. As this area is evolving, it is best to review the options at the appropriate time. If a heat pump is not classified as permitted development at the time of considering this installation, planning consent will be required.

## **Qualifications and Certifications**

Insulation in general should be detailed by a PAS 2030-qualified party (qualified supplier, contractor, or registered architect), to ensure PAS 2030 compliance and so that the end result meets performance expectations. Look for Trustmark membership as well.

In the case of mechanical equipment including heating and ventilation, an MSC-certified supplier should be used. Ensure that MSC certification is provided with solar PV and with ASHP installation. A boiler compensator does not require MSC certification.

Windows should be certified to confirm they reach building regulations standards (FENSA or similar).

A Retrofit Consultant is normally recommended to confirm on site that insulation is installed correctly; but in the case of simple roof insulation this can be optional.

### **Spreadsheet:**

The spreadsheet shown on the following page lists the tested measures, ranked according to energy savings, from least to most energy-saving.

The first column shows energy use in kilowatt-hours per annum. Second column shows reduction in cost of energy bills per annum (current EPC / SAP modeling still provides prices according to 2022, so a bespoke calculation to match to 2023 prices is provided in the adjacent column). CO2 emissions are shown in the next column.

Further columns show payback in cost, approximate cost of measure, lifetime of the measure, payback in years and CO2 savings per annum.

These allow an overall comparison.

The groupings on the lower rows combine likely and/or recommended upgrades to understand the impact of grouped measures (groups often improve less as a whole than if they were implemented singly with no other improvements at any time)

The most impactful improvements singly and then in combination are shown in green highlight.

Note that this dwelling is understood to have a layer of insulation installed in the area of the flat roof covering the rear extension, however confirmation cannot be provided in the form of document acceptable for EPC lodgment so this adjustment has been made on the Energy Report which is not publicly lodged.

The current EPC is provided separately.

**Project Name: Northchurch Road N1 4EE** how much energy is used, the cost of that energy, the carbon footprint and the EPC rating

denotes highly recommended measures

	kwh	2022 £	2023 £	CO2 kg	EPC SAP	EPC C02					
<b>EXISTING PROPERTY adjusted for 50mm insulation to flat roofs</b>	27516	1215	3071	6176	62D	53E					
<b>EXISTING PROPERTY</b>	28543	1252	3170	6398	61D	52E					
<b>SINGLE MEASURES</b>	kwh	2022£	2023 £	CO2 kg	EPC SAP	EPC C02	cost saving/ yr	£ of measure	lifetime of measure	payback in years	CO2 savings per annum
single glazing upgrade to front hall window	27456	1213	3065	6163	62D	53E	6	4500	40	773	13
improve existing loft insulation: remove all boarding, replace or add to existing (recommend replacement) and re-board using supports to ensure boarding does not compress insulation	27117	1200	3032	6090	63D	54E	39	4700	30	121	86
improve existing flat roof insulation: remove roofing and insulate with compressed insulation board or, if possible, insulate on top of existing*	27184	1203	3038	6104	63D	54E	32	5700	30	177	72
both forms of roof insulation upgrade	26783	1188	2989	6018	63D	54E	82	10400	30	127	158
wall insulation throughout (improvement target is the same whether internal or external. Cost is based on external as cost of removal/reinstating of internal fixtures and features not possible to estimate at this time. Includes mechanical ventilation system (Zehnder)	22342	1127	2735	5250	66D	60D	335	46250	40	138	926
Air source heat pump (final size and model to be determined when appropriate but modelled here with a Viessmann 16 KW unit)**	6795	1321	2646	3527	70C	73C	424	8000	20	19	2649
solar PV 2.6 KW facing S and 1.4 KW facing E, including battery	24101	1469	1841	4580	73C	63D	1229	12052	20	10	1596
<b>COMBINED MEASURES</b>	kwh	2022£	2023 £	CO2 kg	EPC SAP	EPC C02	cost saving/ yr	£ of measures		payback in years	CO2 savings per annum
Group A: single glazing upgrade to match + both roof upgrades, compensator for boiler	26342	1172	3123	5923	64D	55D	-53	15250		-290	253
% savings	4	4	-2	4							
Group B: Group A + air source heat pump (no compensator)	6570	1277	2565	3409	72C	74C	505	23250		46	2767
% savings	76	-5	16	45							
Group C: Group A + solar	23415	570	1775	4580	74C	64D	1296	27302		21	1596
% savings	15	53	42	26							
Group D: ASHP + solar (no other improvements)	3381	723	1417	1931	83B	84B	1653	20052		12	4245
% savings	88	40	54	69							
Group E: Group A +ASHP + solar (no compensator)	3156	580	1336	1815	84B	85B	1734	35302		20	4361
% savings	89	52	56	71							

\*cost does not include scaffolding est £4000 additional if required

\*\*cost includes BUS grant --if no longer available, est cost £15000

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