Retrofitting a Grade 2 listed 1680s town house

heritage open days

19 and 20 September 2025

Introduction

Some things we learnt:

- It will cost more than you expect. Make sure you leave a financial buffer when you decide what you want done.
- It will take longer than you expect.
- Living in a building site for months is stressful, even when the builders are nice people – noise, dust, organising parking permits, worrying about progress.
- Moving out would have been more pleasant, but also much more expensive, and we wouldn't have spotted unexpected problems.
- Apply for planning permission and listed building consent for everything at once, even if you don't intend to do it all at once.
- Paying a project management company costs a lot, but they have the experience and contacts to find reliable tradespeople willing to do the work without a long delay.
- Builders, however good, walk on your flowerbeds and damage walls as they walk past.
- Tradespeople can't understand you want to re-use things that are still in good condition, such as the WC. It's much easier for them to discard what they remove and buy new.
- Make people give you their vehicle number plates in advance so you can get them a parking permit before they turn up with equipment or supplies to unload.

Energy generation and storage

1. Photovoltaic panels

Planning permission was given only for panels that cannot be seen from a public street and are unobtrusive from both front and rear. They hide in our valley roof.



2. Battery-storage

Energy from the pv cells goes into a battery under the stairs. On a sunny day we store almost enough energy to keep us going till sunrise the next day.

These were the first changes we made, in 2015. So we just qualified for feed-in tariff.

Insulation

3. External doors

Draught strips, a flap for draughts through the letterbox.

4. Underfloor insulation on ground floor

In 2016, we insulated the front part of the house where we didnlt want carpets. Between the floorboards and the joists in the dining room and in the hallway we inserted a layer of Superfoil (SF19FR) insulation. All the floorboards had to be lifted.

In 2024 we insulated under the kitchen floor. All the floorboards were lifted, breather membrane placed between and over each joist, Warmcel insulation between joists, Pro Clima DA airtight weather resistant vapour check membrane above joists and insulation, floorboards replaced, sanded and polished.

5. Internal wall insulation

We installed Cromar Vent 3 breathable membrane behind the panelling and work units in the kitchen. The joiners carefully detached the units from the wall and replaced them successfully. All we had to do was touch up the paint.

We got an internal layer of Diathonite lime plaster covered with Solo smooth lime plaster added to the external kitchen wall which was only brick.

Some external walls on first floor are papered with V600 thermal liner. This is like very thick wallpaper. It reduces heat loss and damp in corners and cupboards.

The walls in the conservatory are covered with 100mm PAVADENTRO wood fibre insulation boards and coated in lime mortar.

Heating

6. Air source heat pump for water and space heating

We needed planning consent to install an air source heat pump to replace the gas boiler because the house is listed. We suggest you focus on the historical fabric and aesthetics and don’t mention noise in your application.

Some providers insisted on replacing radiators and even pipes. But we believed this wasn't needed. The suppliers’ calculations were based on our energy consumption before the insulation works completed in 2024, not future consumption after the insulation works. We changed to a local company suggested used by friends. They assured us that we did not need to replace any pipes, but we might need to increase our radiator capacity. We decided not to do anything except increasing the radiator size in the kitchen, which had always been too cold. Instead we’d decide after the winter, because the new internal insulation should reduce heat loss by 75% where it’s been installed, cutting heat loss throughout the house by about half.

We got £7500 Government grant.

The heat pump was installed in October 2024. We have been warm enough.

We bought an induction hob, got the gas supply disconnected and saved the standing charge for gas.

Overall saving on gas and electricity approx 15%..

7. Heat Recovery Air Extractors

The fan in the kitchen transfers the heat in the air being extracted to heat up the air being sucked in. Ventaxia produce several sizes that fit the same sized holes as their range of simple extractor fans. (We've blocked it over the winter now we have no gas.)

A Brookvent heat recovery unit in the bathroom alternates inward and outward air flows, and transfers heat through a ceramic plate.

8. Wood-burning stove

With heat from the solar insolation in the conservatory, the drawing room rarely requires much heat, even in winter. We installed a wood-burning stove in 2016, an approved type with low emissions from Lovenholm and Norreskoven. Research has now shown that even low-emission stoves produce particulate pollution. So we don't use it. It usefully blocks the old open chimney, so we don't lose heat up the chimney.

9. Conservatory

Because the existing, shabby conservatory was 20th century plastic, we were allowed to replace it in 2016 with a more thermally efficient one. It is triple glazed.

The roof window shuts automatically when it rains. On sunny days it warms the rear house. We can pump hot air from it into the hall in the front house on cold sunny days.

Glazing

10. Double glazing

In 2016 when we did the first energy-saving measures, conservation officers did not like double glazing in listed buildings. We were allowed to replace one window because secondary glazing would have blocked the fire exit, provided the glass on the exterior layer was barrel glass. The space between the layers of glass is reduced by using inert gas. (argon filling U value 1.3).

11. Double secondary glazing

We installed secondary glazing units inside the other old windows: two Perspex sheets separated by a plastic spacer, kept in place by magnetic strips. They are quite heavy but stay in place well. Including the original glass there are now three layers to insulate against heat and cold, and stop draughts.

Bathroom

12. Heat exchanger

A Brookvent heat recovery unit alternates inward and outward air flows and transfers heat through a ceramic plate.

13. Bath

The bath has been re-enamelled which is both cheaper and more environmentally friendly than replacing it. A friend who did it 10 years ago tells us it lasts well.

14. Shower use

The shower runs cold till the hot water reaches it, so we collect the cold water in a bucket and use it to flush the WC.

Front top floor

15. A hemp hat

With the ceiling and much of the walls being in the roof space, the two rooms on the top floor were cold in winter and hot in summer. We removed the old lath and lime plaster walls and ceiling, revealing the inside of the roof. We found considerable woodworm damage to the beams, and both purlins at the front were cracked. We also found there was no wall between us and the neighbouring house. A structural engineer advised how we could make this safe without destroying the house's history.

Once this was repaired, deep insulation was installed. In reverse order from the room: solo (smooth finish for lime plaster), on Diathonite Thermactive .037 (lime plaster with cork in it, for insulation), laid on laths; breathable membrane, taped to eliminate gaps; hemp between joists, held in place by the membrane; another breathable membrane; roof cavity above the ceiling, but no cavity on the sloping walls.

The rooms lost about 6 inches length and breadth, maybe 3 inches in height.

16. Breathable Paint

There's a lot of confusion about what sort of paint you use on lime plaster. The new plaster in the front top floor rooms was painted with Farrow and Ball casein distemper (available in standard F&B colours) because of the need to maintain breathability. We used the F&B limewash on the replastered upper part of the hallway, which wasn't so good because it made the surface less smooth. We chose F&B primarily because of its ready availability and short delivery time.

Outside

17. Repointing flint wall

Very hard to find someone to do it.

18. Cast iron pipes

We replaced broken gutters and pipes with cast iron ones- more heritage than ecology.

19. Garden

- Pond reduces run-off at times of heavy downpour and attracts dragon flies and frogs.
- Water-butt stores rainwater for washing windows and watering plants.
- The greenery on the wall in the garden will hopefully increase CO2 extraction.
- Two tumblers for composting kitchen waste.

What next?

- Get permission to replace rotten rear window with double-glazed casements.
- Get permission to remove air source heat pump "noise reduction" cover.
- Instal more battery storage so we can buy electricity at night and use it in the day.

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WinACC (Winchester Action on the Climate Crisis), charity number 1150754.
www.winacc.org.uk and on Facebook, Instagram and TikTok

Tradespeople, suppliers and professionals

Almost all are local – Winchester, Eastleigh, Southampton

Architect	2015/16: **CHDP Architecture's David Ashe, now retired.** 2023/4: **Miltiadou Cook Mitzman** https://rupert@mcma.design/ 020 7722 8525 Rupert Cook, Certified Passive House Designer 077 3332 4887 rupert@mcma.design
Conservation and historic buildings advisor	**Pritchard Architecture Heritage** www.pritchardarchitecture.co.uk Giles Pritchard 07775 906815 giles@pritchardarchitecture.co.uk
Survey of house (for planning application)	**Digital Terrain Surveys LLP** www.dtsurveys.com Richard Pike (Partner) 01794 514978 sales@dtsurveys.co.uk
Project management	**Evolution5 Construction Limited** www.evolution5.co.uk Braden Fidler, Quantity Surveyor 07513 725802 braden.fidler@evolution5.co.uk
Solar panels	Company is no longer trading.
Batteries (2017)	**Simpliphi PHI 3.4** "The PHI 3.4TM kWh 60 Amp deep-cycle Lithium Ferro Phosphate (LFP) battery is optimized with proprietary cell architecture, power lectronics, BMS and assembly methods…. modular, lightweight and scalable for installations that range from kWh to MWh."
Battery storage (2025? in discussion)	**Off Grid Pro Ltd** www.offgridpro.co.uk 023 82 250135 David Peel 07742 106028 davidp@offgridpro.co.uk
Flint wall repointing	**Iron Hill Ltd**, Building Conservation and Restoration www.ironhillrestoration.com Nick Johnston 07429 484018 / 02380 432638 nick@ironhillrestoration.com
Air source heat pump – chosen supplier	**Cinergi Ltd www.cinergi.co.uk** 0800 321 3142 Kate Loveridge Operations & Finance Manager kate@cinergi.co.uk
Acoustic report for air source heat pump	**MSAFE Technologies Ltd**, www.msafe.co.uk 0333-8000-700 Andy Keane (Director) 07748-655423 andy.keane@msafe.co.uk
Hob	We bought a Neff because it fitted in the space left when we removed the gas hob. Supplied by **Appliances Direct** https://www.appliancesdirect.co.uk/
Electrician	**James Liston Building Services Limited** https://www.jlbuildingservices.co.uk/contact-us 023 8077 7017 info@jamesliston.co.uk
Lifting kitchen floor, moving sink and cupboards, insulating	**R&N Carpenters and Joiners Ltd** https://randncarpenters.co.uk/ Christopher Lush, Director, 07817089978 Chris@randncarpenters.co.uk
Underfloor insulation in the kitchen	**Warmcel** insulation between joists with **ProClima vapour check SolitexPlus membrane** above and below insulation, taped in place
Kitchen Insulation behind units & panels	**Cromar Vent 3** breathable membrane

Plasterer – lime specialist	**Clive Wilson** 07979 038529
Air extraction	**HR100R mini air handling unit, Ventaxia**
Floorboard sanding and polishing	**Ultimate Floor Sanding** http://floor-sanding-in-winchester.co.uk/floor-sanding-quote-winchester/ Anne Cassidy: 07974 921743admin@ultimate-floor-sanding.co.uk
Secondary double glazing	Fitter has retired. Search on internet for something like Perspex Secondary Glazing" and "Magnetic Tape Steel Tape Secondary Glazing Attachment Kit".
Thermal wallpaper	**Wallrock KV600 Thermal Liner and Wallrock Thermal Liner adhesive** bought on internet.
Conservatory triple glazing	Supplied by **IQ Glass Solutions Ltd,** https://www.iqglassuk.com/ 01494722880 hello@iqglassuk.com
Conservatory stone floor, surplus used for shower walls	Jerusalem tumbled gold limestone from **Travertine Tile Store** https://www.travertinetilesuk.com/ 0203 941 6101 sales@travertinetilesuk.com
Bath re-enamelling	**Mendabath Hampshire** https://www.mendabath.co.uk/ Stephen@mendabathse.co.uk 07825 575732
Bathroom framework for hemp insulation, and for shower	**Maple Tree Carpentry & Renovations** https://www.mapletreecarpentry.co.uk/ 07830 211698 lee@mapletreecarpentry.co.uk
Joiner to match architrave and wainscot rail removed / broken during building works	**Burville Furniture & Purpose-made Joinery** 6 Charles Close, SO23 7HT Simon A Burville 07803 020408
Bathroom fan	**Brookvent** heat recovery unit
Structural Engineer: advised about cracked purlins and woodworm	**SFK Consulting LLP** www.sfkconsulting.co.uk 023 82 516969 Gary Wood (Partner) gary@sfkconsulting.co.uk 07767 351460
Replacement of beams, steel splint to cracked purlin, hemp insulation	**Maple Tree Carpentry & Renovations** https://www.mapletreecarpentry.co.uk/ 07830 211698 lee@mapletreecarpentry.co.uk
Roof membranes	**Pro Clima Solitex Plus / Pro Clima Intel Plus breathable membrane** www.proclima.com
Adhesive tape membrane	**Tescon Vana**
Hemp insulation	**80mm Thermo Jute/Thermo Hemp**
Scaffolders	**AJ Bull Scaffolding Ltd** ajbullscaffolding@gmail.com 07544 729482
Window glass repair	**E R Wright Glass** https://wrightsglass.co.uk/ 023 8055 6437 info@wrightsglass.co.uk
Carpet cleaning	**The Carpet Cleaners** https://thecarpetcleaners.co.uk/locations/winchester/ 0800 505 3183 / 07803 806655 info@thecarpetcleaners.co.uk

Chronology

Action	Date	Comments
Acceptance of the need for double glazed window by conservation officers	July 2014	Conservation officers agreed to double glazing on one window to maintain a fire escape route. Double glazing of south-facing window refused.
Replaced all light bulbs with LEDs	Sept 2014	The cheapest and simplest way of reducing electricity consumption.
Listed building consent for alterations	Sept 2014	A number of closely negotiated conditions
Acceptance of tender	July 2015	All major building items
Photovoltaic Cells	Dec 2015	Conservation officers required a reduction of panels from 12 to 8, and that they be mounted as out-of-site as possible. They had to be repositioned to comply with the plans.
Double glazing and secondary double glazing	March – June 2016	
Conservatory made weathertight	Sept 2016	There was a long snagging list
Additional insulation work in conservatory	May 2017	To improve insulation and address condensation problems
Sign off of Battery Storage	Sept 2017	
Dining room and hallway underfloor insulation	March 2019	
Appointed Rupert Cook, architect, to recommend best measures to increase insulation	Jan 2022	To include: • target u-value • thermal continuity • managing risk of interstitial condensation • selection of insulation material, depending on location; performance/ hygroscopic/ low carbon/ non-putrescible • future damage to insulation/ vapour control/ airtight layer.
Agreed approach and narrowed down option preparty to discussions with WCC	April-May 2023	
Appointed conservation architect/heritage adviser	May 2023	To support us on the application and to carry out the Statement of Significance, to provide advice from a heritage perspective on the proposals, liaise with the Conservation Officer and prepare the Heritage Statement required
Commissioned detailed survey report	June 2023	To show room dimensions etc
Asked WCC for pre-application advice	Oct 2023	

Action	Date	Comments
On-site discussion with architect, conservation architect/heritage adviser and WCC Historic Environment Team Leader	Nov 2023	
WCC Historic Environment Team Leader supports intention of project, says Listed Building Consent is required, but not full planning consent as the works are internal; and makes other comments:	Dec 2023	• insulation from below for the roof is preferred • ecological input not required • need method statements for each type of insulation/ wall/ floor/ roof type which should cover all the work included in the application, and specifications of these proposed materials. • suggests including the areas between the ceilings and floors, at the perimeter of the house, for completeness as a comprehensive approach to insulating the fabric of the house • use as a case-study
Listed building consent application submitted to WCC	Feb 2023	WCC to consult neighbours and the historic environment officer.
City Council approved planning application	April 2023	
Finding specialists for the work proves difficult. We decide to appoint a builder to bring in specialist trades.	May-June 2023	So we need a quantity surveyor to create a Schedule of Works pricing document
Commissioned Schedule of works from Quantity Surveyor at Evolution 5	July 2023	
We accept Evolution 5 offer to support us with the tender and getting a contractor into contract.	Sept 2023	They have a broader list of contractors and suitable trades; and tradespeople are more likely to prioritise work coming from them.
We decide to use Evolution 5 for construction management	Oct 2023	Gives more flexibility about what work is done when than going via a main contractor
Priced schedule of works completed	Nov 2023	
Decided what we could afford/what disruption we could cope with and agreed contract with Evolution 5	Nov 2023	
First quotation for air source heat pump (not in the contract with Evolution 5)	Nov 2023	We rejected because the firm was inflexible about radiators, pipes etc). We approach Cinergi, a firm which a friend had used.
Asbestos survey	Jan 2024	Everyone had overlooked need for this before builders could strip out walls etc
Work started under contract with Evolution 5.	Jan 2024	
Contract ended	July 2024	
Making good / redecorating	Aug-Sept 2024	

Action	Date	Comments
Cinergi install air source heat pump	Oct 2024	
Install "noise insulation" cover to heat pump	Dec 2024	Delay caused by confusion about who was ordering it
Realise cover makes sound louder; invite Council Historic Buildings officer and Environmental health noise lead to listen and advise	Feb 2025	

2023-2024 costs included:

Advice and permissions

- Architect fees
- Building Control (WCC)
- Conservation architect to give heritage advice
- Planning / listed building application
- Structural engineer to advise on woodworm and cracked purlins
- Asbestos survey and report

Evolution5 fees for contract management and works

- Initial contract sum – which included daily fee for "preliminaries" e.g. site manager, insurance, waste disposal, carpet protection etc
- Variations to deal with things not in the contract ("acts of god" like the woodworm; additions we requested like solo later to have a smooth finish; things E5 had left out)

Other payments for building work

- Repointing of rear wall
- Re-enamelling the bath
- Plasterer to make good
- Joiner to match architrave and wainscot rail removed / broken during building works

Other purchases

- Hob
- Shower tray and shower
- Bathroom air exchanger
- Air source heat pump

ASHP

- Cinergi to supply and install
- Noise report on ASHP
- Noise cover purchase
- Noise cover installation
- To come – noise cover removal

Planning, grants and other information

Planning restrictions: Some retrofitting of homes needs planning permission. This mostly affects homes which are listed or in a conservation area. Winchester City Council published *A Guide To Making Your Historic Building More Energy Efficient* in 2023 There are a very few things that everyone needs planning permission to do. The same guide tells you what these are.

Pre-Applications planning advice and enquiries: Winchester City Council offers an extensive pre-application advice service, to assist building owners in planning changes to their historic building. Details, including fees, here: https://www.winchester.gov.uk/planning/pre-application-service#:~:text=The%20service%20encourages%20early%20proactive,be%20more%20efficient.

Listed building consent: Winchester City Council Historic Environment Team Leader Daniel Ayre dayre@winchester.gov.uk

Building Regulations: Separate to planning permission and listed building consent, you may need Building Control approval under Building Regulations. The Building Regulations address issues of the safety, quality and efficiency of new building work. For advice, contact the Building Control Team BuildingControl@winchester.gov.uk 01962 848176.

Financial help

Boiler Upgrade Scheme : one grant per property. Current grants are available for:

- £7,500 towards an air source heat pump
- £7,500 towards a ground source heat pump (including water source heat pumps and those on shared ground loops)
- £5,000 towards a biomass boiler

The system you install must meet certain standards, such as minimum efficiency levels. The maximum capacity is 45kWth for individual systems and 300kWth for shared ground loops. Find out more about heat pumps and biomass boilers at https://energysavingtrust.org.uk/energy-at-home/heating-your-home/

Hampshire County Council Solar Together: Reduced prices through a joint bulk purchase scheme. Register at https://www.hants.gov.uk/landplanningandenvironment/environment/climatechange/whatarewedoing/projects/solarbuyingscheme.

Warmer Homes provides fully funded insulation, solar panels and other energy efficiency measures for owner-occupiers and private renters living in low-income, off-gas households. The scheme is supported by Winchester City Council and is available until March 2025. Apply by visiting **www.warmerhomes.org.uk/apply** or by calling 0800 107 857.

More information

WinACC's website has links to much useful information in retrofitting: https://www.winacc.org.uk/retrofit-your-historic-home/

Cambridge City Council have published a very detailed report on 'Retrofitting your home' which shows the many ways that homes of different sizes can be retrofitted to make them more energy efficient.- https://www.cambridge.gov.uk/media/11677/retrofitting-your-home-report-non-accessible-version.pdf