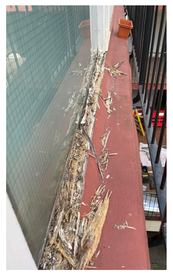
CRESCENT HOUSE

1. bush-hammered, in situ concrete bands
2. hardwood timber window frames
3. pivoting centrally hung casements
4. aluminium opening lights
5. georgian wired glass
6. white infill panels (spandrel panels)
7. stepped profile of the building along the curve of the road
8. mosaic tiles on exposed floor slab edges
9. rendered concrete cross walls, painted rust-red colour not original
10. built in timber 'floating' shelves

Deterioration of the hardwood frame/cill on the west façade where the glass pane has become exposed to the elements. Evidence of mould growth.



Deterioration of the softwood frame/cill on the kitchen window facing the internal lightwells.

Deterioration of the hardwood frame on the west façade (oriel window).

Paintwork deteriorating on timber frame and the spandrel panel. Evidence of mould growth.

NOW

Condensation and mould reported around the bay windows, party wall junction and the bathroom where there is no insulation.

85% *suffer from condensation or mould growth*

50% *feel their windows don't open sufficiently to get good ventilation*

77% *feel uncomfortable draughts in their home, especially close to the windows*

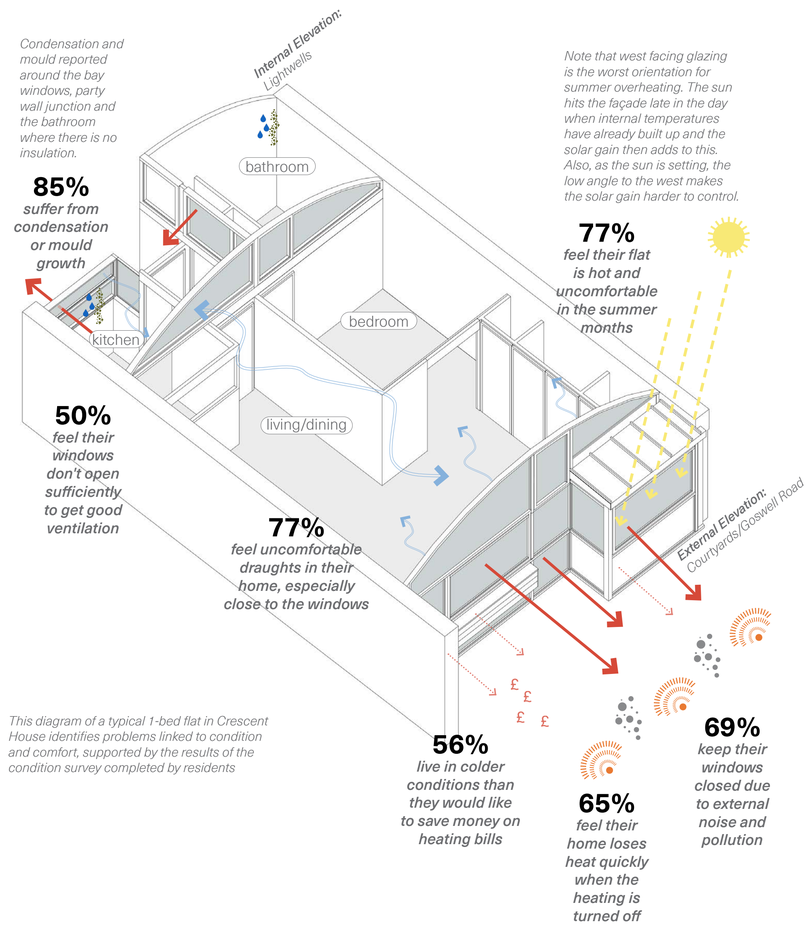
56% *live in colder conditions than they would like to save money on heating bills*

65% *feel their home loses heat quickly when the heating is turned off*

69% *keep their windows closed due to external noise and pollution*

77% *feel their flat is hot and uncomfortable in the summer months*

Note that west facing glazing is the worst orientation for summer overheating. The sun hits the façade late in the day when internal temperatures have already built up and the solar gain then adds to this. Also, as the sun is setting, the low angle to the west makes the solar gain harder to control.



This diagram of a typical 1-bed flat in Crescent House identifies problems linked to condition and comfort, supported by the results of the condition survey completed by residents

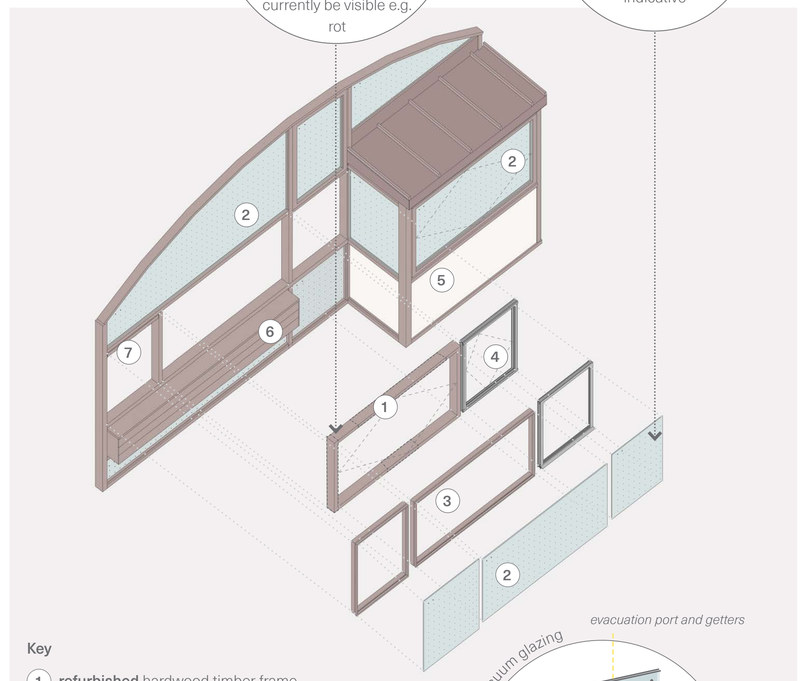
Key

- Heat loss through single glazing
- Heat loss through external walls & thermal bridges (incl. window frame)
- Uncontrolled incoming air (draughts)
- Excess solar gains (summer)
- Noise pollution
- Air pollution
- Mould growth
- Condensation build-up

CHALLENGES

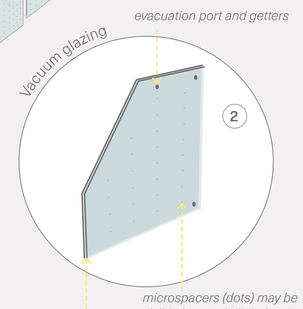
Potentially significant replacement of partial or whole frames/beading, dependant on amount of damage found. This includes damage to the frames which may not currently be visible e.g. rot

Increasing the thickness of the glass will likely mean that the glass is very slightly darker. Microspacers/ plugs/getters are indicative



Key

1. **refurbished** hardwood timber frame
2. **new** vacuum glazing
3. **new** hardwood timber beading - external
4. **refurbished** aluminium framed opening window
5. **new** spandrel panels
6. **refurbished** bookshelf with addition of insulation internally
7. **new** locations for background ventilation to be incorporated



This drawing highlights the different elements of a typical, **refurbished** *window at Crescent House. The principles can be applied to all windows in the block, including the kitchen and bathroom windows where a similar approach will be used on the softwood frames.*

overall thickness of vacuum glazing panels is 8-9mm thick (single glazing is typically 3-6mm thick)

u-value 0.5Wm²K (single glazing 5.7Wm²K)

PROPOSAL

CRESCENT HOUSE PILOT PROJECT

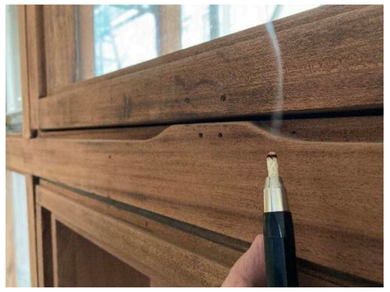
TESTING OF THE PROPOSALS

A suite of tests have been carried out by the Building Research Establishment to provide indicative performance characteristics of the existing windows. Testing of the existing windows was carried out in February and follow-up testing of the repaired and upgraded windows was carried out in September. The findings are summarised below.

AIRTIGHTNESS TESTING

The airtightness of the external façades has been tested using a blower door to pressurise the apartment, and smoke pen to highlight air leakage paths. The test has been re-run following refurbishment of the window frames & installation of the vacuum glazing to measure any change in the level of air leakage.
Testing the existing windows showed significant air leakage between the opening lights & frames, through the louvred window in the bathroom and between frames and the walls. The results below and the photographs from the smoke pen survey show that this air leakage has been siginificantly reduced by the refurbishment works.

Before refurbishment: air (some) leakage visible through junction between frame and pivot window.



After Refurbishment: minimal air (smoke) leakage at same junction between frame and pivot window.

RESULTS

Whole home average airtightness - before: **8.13** $m^3.hr^{-1}.m^{-2}$@50Pa
Whole home average airtightness - after: **4.82** $m^3.hr^{-1}.m^{-2}$@50Pa

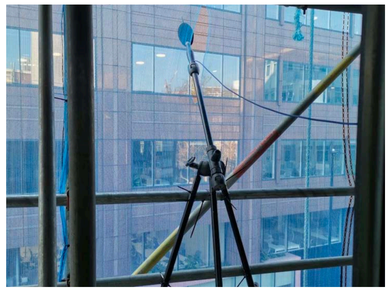
To put the result of 4.82 m^3.hr1.m-2@50Pa into context, building regulations say that new dwellings should achieve maximum air leakage of 10 $m^3.hr^{-1}$.m-2@50Pa. However, the building that is used as a benchmark (the notational dwelling) in the building regulations has an airtightness of 5 $m^3.hr^{-1}$.m-2@50Pa.

This means the refurbishment works have made a significant impact, will reduce the amount of draughts in the home, will reduce the amount of heat lost and will mean the airtightness within 347 Crescent House is comparable with a good performing new home.

AIR LEAKAGE

ACOUSTIC TESTING

The amount of noise admitted through the façade on Goswell Road has been tested using sound meters/microphones measuring the noise externally & internally for a period of seven days.
This showed that the existing windows had a poor acoustic performance, which was likely to be made worse by the significant air leakage paths.
The same test was run following refurbishment of the window frames & installation of the vacuum glazing which showed a noticable reduction in the noise experienced in the flat.



Above: microphone measuring external noise levels

Above: microphone/sound meter measuring internal noise levels

RESULTS

The figure (D) in the table below is the sound reduction provided by the windows and frames.

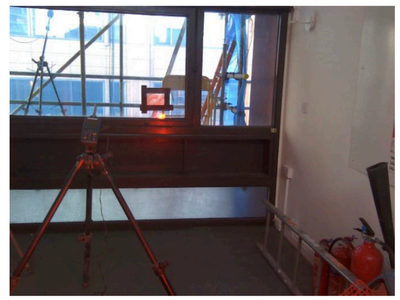
Test number	Test element	Measurement details	Overall Difference *(D)*
L152-007	Original window system	Logarithmically averaged overall performance for selected hourly results in **Table 2**.	33.7 dB
L152-014	New window system	Logarithmically averaged overall performance for selected hourly results in **Table 4**.	36.4 dB

From the results of the acoustic testing, the newer installed window system (LandVac) provides an increase in the acoustic performance by +3dB which equates to an approximate doubling of the original window system performance.

NOISE

THERMAL IMAGES

An infrared camera was used to carry out a thermographic survey of the windows to determine where conductive heat loss, structural defects, air leakage and thermal bridging occur. The survey of the existing windows showed localised heat loss around window frames, in the kitchen & oriel window roofs and the bookshelf on the external façade. After the work to the windows was complete the areas where heat loss had been identified were re-photographed to determine any change. The results of the thermographic survey are indicative at this stage as on the day the survey was carried out the difference between the interal and external temperature was less than 10ºC.



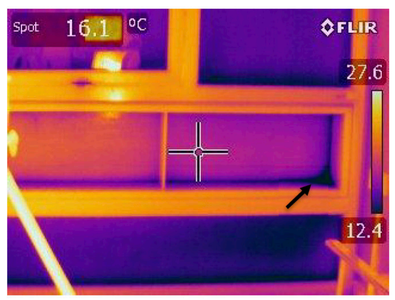


Figure 12: Thermal Image shelving - heat loss highlighted Location THL5 (see Figure 7)

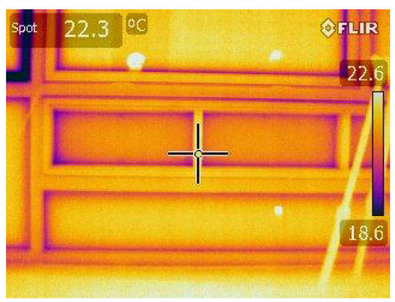


***Figure 21:** Thermal Image shelving minimal heat loss highlighted Location THL5 (see figure 7)*

RESULTS

The images above highlight a reduced heat loss through the bookshelf. A third set of thermal images will be taken in November when it will be easier to maintain a temperature difference of 10ºC.

THERMAL

FAQs

Is wall insulation inside the pilot flat included?

Wall insulation is no longer being considered as part of the pilot project or as part of the repair and refurbishment project for the remaining windows. Insulation will be included where regulation requirements state it should be used.

Is the ground floor soffit (beneath the coldest, first floor flats) to be insulated as promised?

The ground floor soffit will be insulated as part of this project.

Will roof insulation be included, as promised?

The roof will need to conform to Part L of the Building Regulations and insulation will be required to ensure conformity with the these.

Will treatment of a boiler flue (even a dummy flue) be included in the pilot flat?

Some flats are likely to be able to remain on gas heating but flues may need to be re-positioned and other flats are unlikely to be able to remain on gas central heating due to the flue arrangements and changes in regulation. This is beyond the project teams' control, an electric heating option has been installed within the pilot flat for residents to view.

Has the district hot water heating scheme been finally abandoned?

There are no plans to pursue a district or communal heating scheme for Crescent House currently.

Will existing boiler flues be accommodated?

Where it is safe to do so and regulations allows, properties could remain on a gas heated system. Flues may need to be repositioned or adjusted to suit the new glazing for example. Some flats are unlikely to be able to remain on a gas heating system due to regulation changes and the proximity of openable windows. Residents affected by these changes will be contacted separately.

Will I have to leave my flat for the works - if so, where will I go - and what if I refuse?

There has been a lot of discussion about the logistics of undertaking the work in individual flats and there will be a need to relocate residents to temporary accommodation while the work is being carried out in their flats. It is anticipated that three flats will be renovated at a time and as a result three vacant flats will be provided to residents as temporary accommodation. The pilot flat has been renovated to show the standard of temporary accommodation that will be provided.

Where can residents store possessions during works to keep them safe, dry and clean?

Assistance will be provided to Residents to move into the temporary accommodation. With regard to possessions, Residents can take any valuables to the temporary accommodation with them or opt to have valuables put into lockable storage that will be provided. Furniture and possessions left in their flats will be moved out of the required working areas and covered and protected from dust etc during the works.

Is it proposed to work on all 152 flats at once, on one at a time?

It is envisaged that three flats will be worked on at a time. The sequence of work will be agreed with the contractor during the contract negotiations and Residents will be informed of this sequence in plenty of time prior to any works commencing.

How long will works to each flat take from start to finish - and in view of 5x overrun on GAH will the contractor pay compensation to residents for delay?

The time taken to complete the work to a flat will be dependent on a number of factors such as the amount and condition of windows. Before any work starts to the property, the contractor will provide a programme of the work required and how long it is expected to take to complete. These details will be shared with residents. Great Arthur House has a different window system and is not comparable to the work being completed on Crescent House.

Will there be safe access to (and fire escape routes from) my flat when works are done to other people's flats?

Safe access, emergency or otherwise will be maintained at all times during the work and any changes to routes into or out of the building will be communicated and appropriately signposted as necessary including emergency exit signage.

What happens if one or two residents agree then withdraw their agreement for contractor access, threatening progress for all (as happened at GAH)?

Access to properties can be refused for many reasons such as personal reasons. The contractor is expected to prepare for this, and regular contact will be maintained with residents to help allay any concerns or manage the access before significant effect can occur to the project. There is also the option to start another property at short notice or continue with other works until reasonable access can be made to complete the work. Great Arthur House has a different window system to Crescent House and had to be dealt with in a different manner.

Will the shabby, run-down shopping arcade be included?

The commercial units on the ground floor are not included in this project.

Will making good the bungled concrete repairs be included, by pressure washing or similar?

The concrete repairs are subject to approvals by relevant stakeholders and are matched as close as possible to the concrete under any existing staining. Cleaning the concrete will not form part of these works.

Will rents increase as a result of the works?

Rents are set initially with reference to a formula which adheres to the rules set by the Ministry of Housing, Communities and Local Government. Rents are then reviewed annually and are subject to maximum increases, again with reference to the rules set by central government. We are not able to increase rents outside the formula, for instance to cover additional maintenance or project costs.

Why have the project costings—first promised three years ago—still not been provided?

Costs have been provided as part of any leasehold requests with sales and estimated costs have been shared when appropriate. The cost estimates will be shared as and when they are updated. Further information can be requested via the Homeownership via the following email address: home.ownership@cityoflondon.gov.uk

Are the costs of the options part of the appraisal of the options, and if so what weight are costs given? If they are not, why not?

The decision has been made to pursue only a repair and refurbishment option and the other considered options will no longer apply.

Is the Quantity Surveyor appointed and is the QS making strategic input?

A quantity surveyor has been appointed and has been fundamental in calculating the costs for the works.They have completed soft market testing with suppliers, manufacturers and contractors.

When will leaseholders have costings of the three options (total and broken down per flat)?

Only one option will now apply, and these costs are now being shared with colleagues in the homeownership team.

When will leaseholders payment stages be produced?

The final costs will not be known until the work has been tendered. Once we have these costs, we can share these with colleagues in the Homeownership team who will in turn write to leaseholders as part of the section 20 process. Further information on payment options will be shared in the form of an electronic leaflet on the website but for more information, please contact Home Ownership home.ownership@cityoflondon.gov.uk

Will the City fully compensate for damage to floor coverings, fittings, built-in furniture, decorations and electric & piping runs?

The contractor will be responsible for making good areas disturbed during the work. They are unlikely to be able to match older paint finishes for example but will avoid damage to any finishes where practical. Each property will vary with flooring, furnishing and decorations, and the contractor will be expected to complete pre-work condition surveys, and they will advise residents at the time of this survey.

Where do the estimates given to those purchasing flats in Crescent House come from?

Estimates are prepared by those responsible for the work and then shared with colleagues in the Homeownership Team who then share with the requesting parties.

Originally, the Tender was planned in Sep 2023, but now the Tender is planned in Jan 2024:

1. When is the deadline for Stage 1 of the Tender ?
2. When is the deadline for Stage 2 of the Tender?

It is anticipated that the Tender Process will be completed and a Contractor appointed in Late Spring 2024.

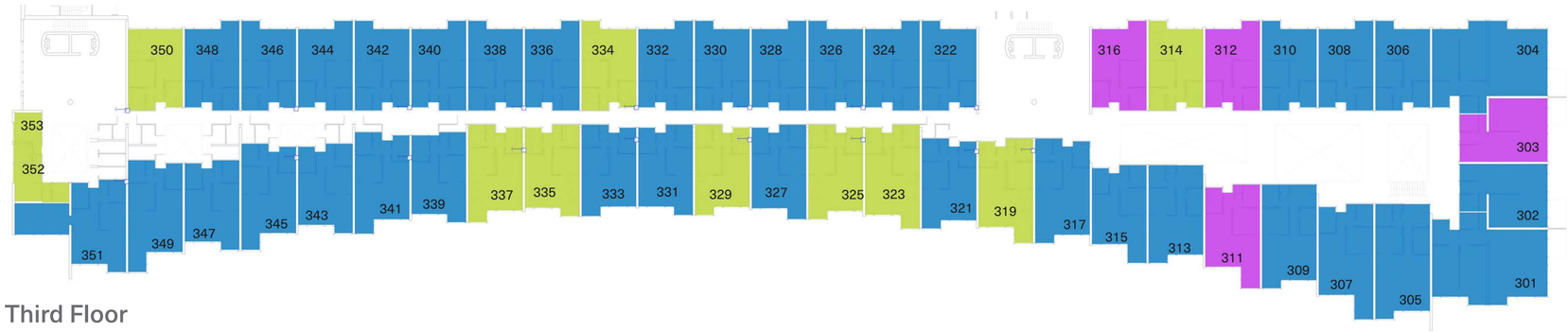
What warranty will be there against mass failure (not the odd pane but wholesale failure of the vacuums)?

The Landvac glass warranty for any failure is 15 years.

What contractors' warranty will be available on windows repairs works? For example, to cover possibility that they miss a rotten piece of window frame that within 5 years need replacing.

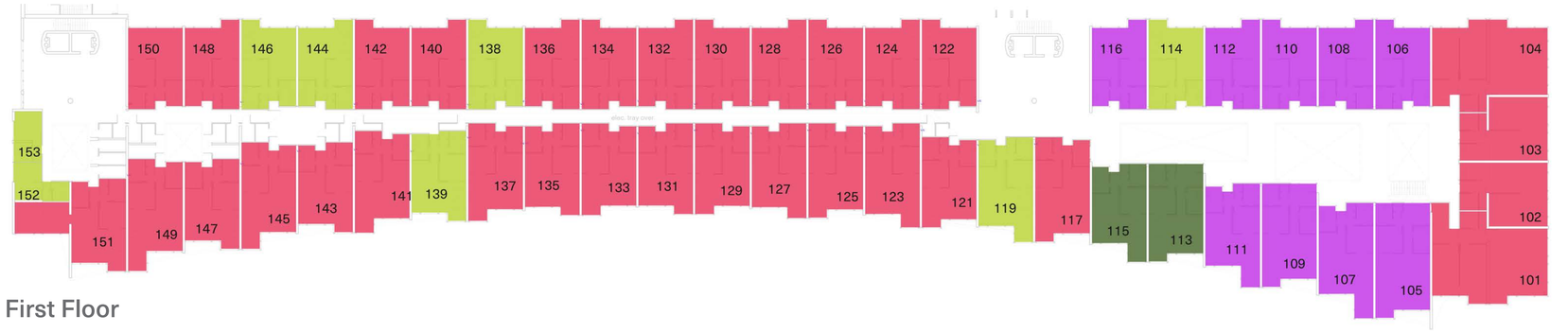
We are anticipating that a 10 year workmanship warranty will be provided by the Contractor.

HEATING



Third Floor

Second Floor



First Floor

New electric heating will be required

Existing boiler flue complies with current building regulations.

Possible to locate a boiler flue in a location to comply with building regulations. However, electric heating is still recommended.

Home already has electric heating

Possible to locate a boiler flue within solid panel at high level in the bathroom. However, electric heating is still recommended.

Chamberlin, Powell & Bon's original scheme used a district heating system that distributed hot water (for heating and hot water in the home) from a centralised, coal fired, heating system below Great Arthur House. This system was decommissioned and individual heating systems installed in each home. These are a mixture of gas fired boilers and electric heating systems. Many of the gas boiler flues have been installed through single glazed windows by cutting a hole in the glass. For two reasons it will not be possible to replicate this arrangement:

Firstly, it is not possible to retain the integrity of the vacuum glass if it has a hole through it.

Secondly, Part J of the Building Regulations does not allows gas flues to be within 300mm (minimum) of an opening window, or within 150mm of an opening into a building (for example, a window frame).

Therefore it will necessary to remove the gas heating from the homes shown on the plans opposite.

The works to the windows, new insulation to the roof & exposed first floor soffits are helping to make the provision of low carbon heating to Crescent House viable. These works will reduce the heating demand to a level that means heating the homes with high heat retention electric storage heaters will cost less than the current cost to heat the homes with gas.

City of London propose to install new electric heating to tenanted homes.

City of London will contact leaseholders with proposals for the removal of gas boilers.

VENTILATION

Third Floor

Second Floor

First Floor

Aereco System: 1

Aereco System: 4

Aereco System: 5A

Aereco System: 5C

Aereco System: 3

Aereco System: 5

Aereco System: 5B

Bespoke design required

THE NEED FOR VENTILATION

All homes need to be ventilated to maintain good air quality and avoid condensation and mould growth. Ventilation is usually provided by a combination of opening windows and mechanical extract fans in bathrooms and kitchens.

Chamberlin, Powell & Bon included mechanical ventilation in their original design for Crescent House. Shared fans serving several flats were included on the flat kitchen roofs and within the roof level tank rooms. These fans provided constantly running background ventilation to all the single aspect flats and to a number of the dual aspect homes (see diagram below). Over time some of this ventilation has either been replaced, or removed and in some instances the extract grilles (located in bathrooms and kitchens) have been sealed up.

It isn't clear if mechanical ventilation was included to the homes to the southern end of Crescent House in CPB's original design, however, it is evident that individual extract fans have been added to most, if not all of these homes.

Part F of the Building Regulations recognises that in order to reduce the risks of condensation, mould growth and poor indoor air quality, adequate rates of ventilation are required. This is especially so when energy efficiency improvements are made to existing homes as the improvements are likely to reduce the amount of uncontrolled air movement through the building fabric.

As a result of the recognised link between improved thermal performance and the need for better, more controlled mechanical ventilation, new mechanical extract will be provided to all homes. This will take the form of adding a demand controlled ventilation system to each home.

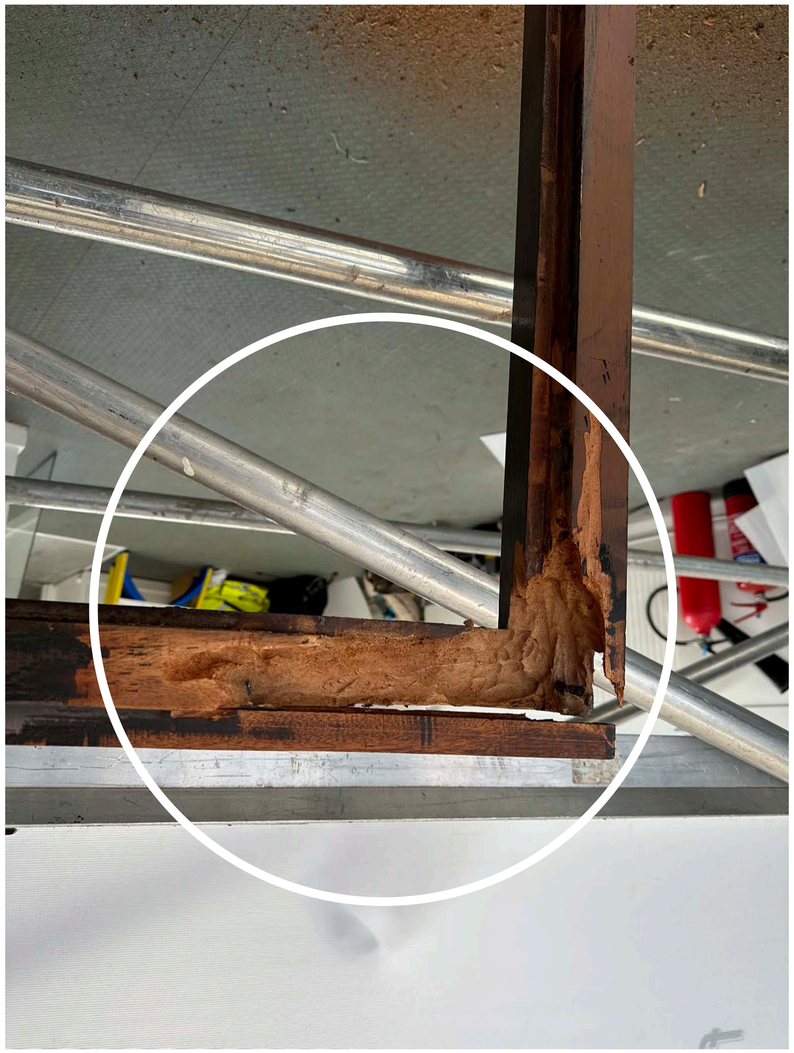
DEMAND CONTROLLED VENTILATION (DCV)

Demand controlled ventilation adjusts ventilation extract rates based on the internal conditions in the home; as the moisture content of the air increases, extract rates increases to remove more air from the home. The system does not require any user input to operate, and uses passive technology to control the amount of air being extracted from the home.

In most instances, the new fans will replace existing communal fans and existing internal grilles will be replaced with new demand control extract grilles. In the homes to the southern end of the block existing individual fans will be replaced with new individual DCV fans. Some homes will require new extract grilles in the external walls, these are shown on the application drawings.

REPAIR PROGRESS PHOTOS

The same corner joint is shown in each of these three photographs.
This photo shows the window frame prior to starting the Pilot Project and there is no obvious visible rotten timber.



This photos shows the corner junction after the rotten timber has been removed.

This photo shows the repaired frame (before final finish applied) with new sapele spliced into frame, spliced timber mechanically fastened to existing frame and resined in place.

REPAIR PROGRESS PHOTOS

The same frame joint is shown in each of these three photographs. This photo shows the corner post of the window frame prior to starting the Pilot Project and there is no obvious visible rotten timber.

This photos shows the corner post after the rotten timber has been removed.

This photo shows the repaired post (before final finish applied) with new sapele spliced into frame, spliced timber mechanically fastened to existing frame and resined in place.

WINDOWS BEFORE REFURBISHMENT

Flat 347 Crescent House prior to starting the Pilot Project

WINDOWS BEFORE REFURBISHMENT

Flat 347 Crescent House prior to starting the Pilot Project

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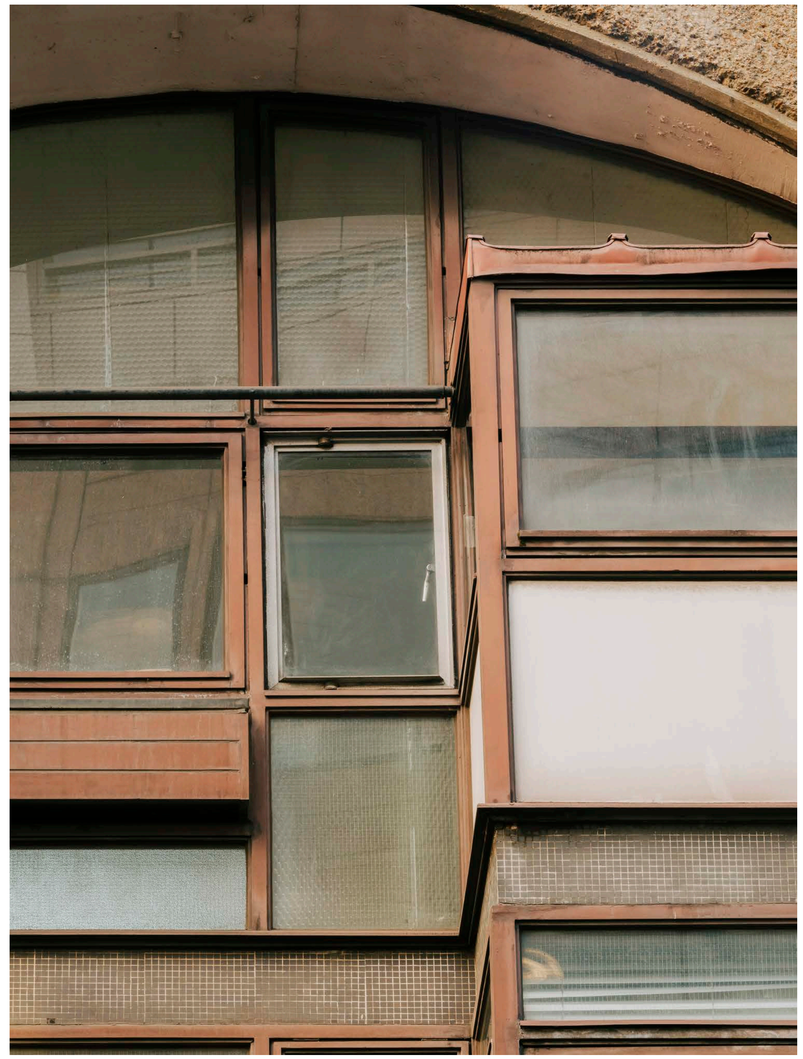
WINDOWS BEFORE REFURBISHMENT



Flat 347 Crescent House prior to starting the Pilot Project

PROGRESS PHOTOS

Work in progress in 347 Crescent House