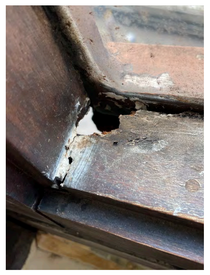
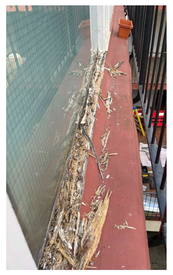
CRESCENT HOUSE

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
10. built in timber 'floating' shelves

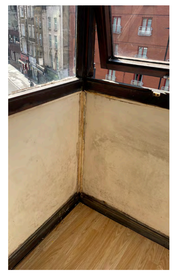


Deterioration of the hardwood frame/cill on the west façade where the glass pane has become exposed to the elements. Evidence of mould growth.



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

Deterioration of the hardwood frame/vv 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*

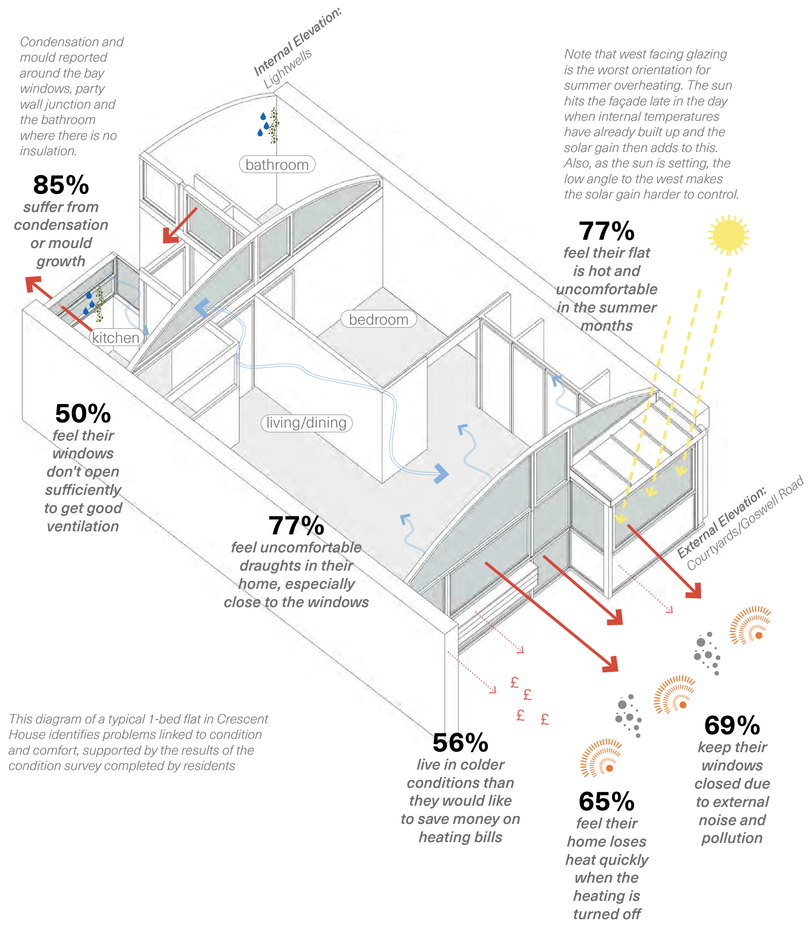
56% *live in colder conditions than they would like to save money on heating bills*

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

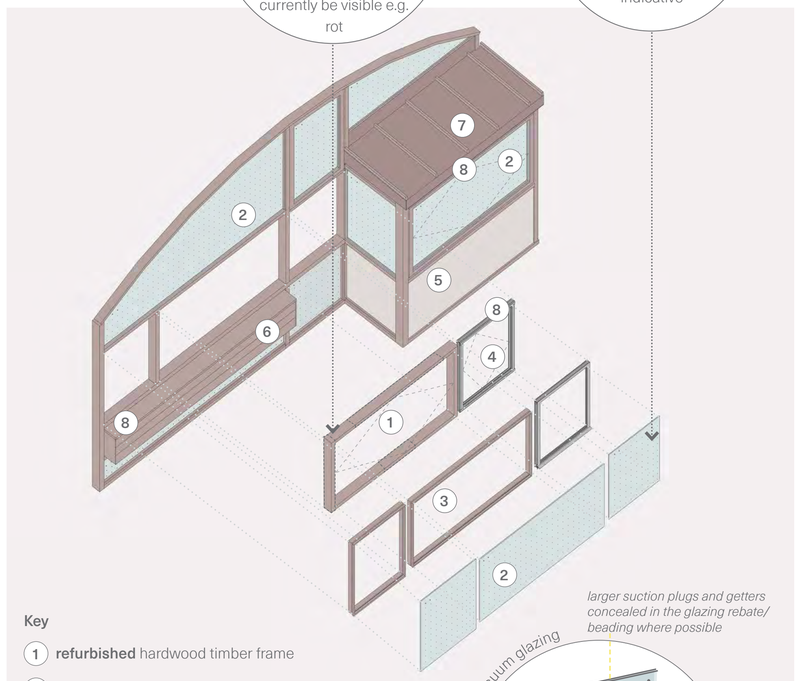
Key

- 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

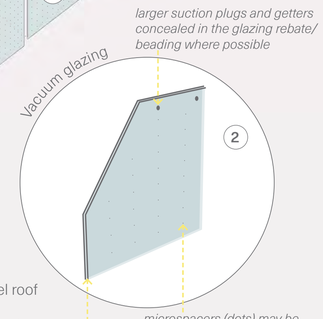
Potentially significant replacement of partial or whole frames/beading, dependant on amount of damage found. This includes damage to the frames which may not currently be visible e.g. rot

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. **refurbished** hardwood timber beading - external
4. **refurbished** aluminium framed opening window
5. **new** spandrel panels
6. **new** bookshelf
7. explore potential to add insulation to the underside of the oriel roof
8. possible 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, apart from the internal lightwell facing softwood windows (these are not described as significant in heritage terms). Principally, the vast majority of the frames are hardwood and open by pivoting centrally horizonally, vertically or top hung.*

PROPOSAL

CRESCENT HOUSE PILOT PROJECT

TESTING OF EXISTING BUILDING FABRIC

A suite of tests has been carried out by the BRE to provide indicative performance characteristics of the existing window systems. These tests provide baseline data.
The tests will be re-run following refurbishment & installation of vacuum glazing in the windows, and the improved performance compared against the baseline data.

AIRTIGHTNESS TESTING

The airtightness of the external façades was tested using a blower door to pressurise the apartment, and smoke pens to show air leakage paths.
This showed significant air leakage paths around window frames.
The test will be re-run following refurbishment of the window frames & installation of the vacuum glazing to measure the reduction of air leakage.

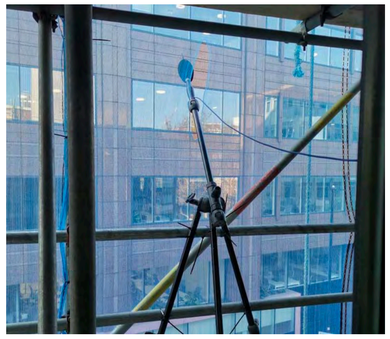
Above: air leakage paths through/around the window frames demonstrated using a smoke pen

Above: blower door test equipment mounted in the front door

AIR LEAKAGE

ACOUSTIC TESTING

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



Above: microphone measuring external noise levels

Above: microphone/sound meter measuring internal noise levels

NOISE

THERMAL TESTING

An infrared camera was used to carry out a thermographic survey and determine where conductive heat loss, structural defects, air leakage and thermal bridging within the building fabric occur.
This showed localised heat loss around door penetrations, pipe work and window frames, as well as in the kitchen & oriel window roofs and the bookshelf on the external façade.
The test will be re-run following refurbishment of the window frames & installation of the vacuum glazing and insulation to the main concrete vaulted roofs, first floor concrete soffit & bookshelf, to determine the reduction in heat loss.

Above: infrared photographs showing key heat loss junctions around the flat. A darker colour indicates higher levels of heat loss, which may lead to condensation and mould developing in that area.

THERMAL

GENERAL PROCESS

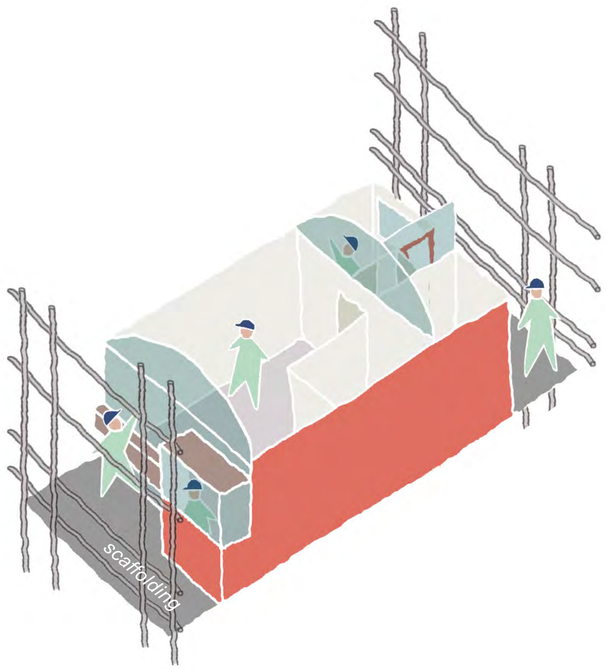
1
Glass measurements & preliminary condition survey undertaken
1 week

No works carried out , scaffold remains up

2
Repairs to frames undertaken
Duration varies per flat depending on condition of existing frames

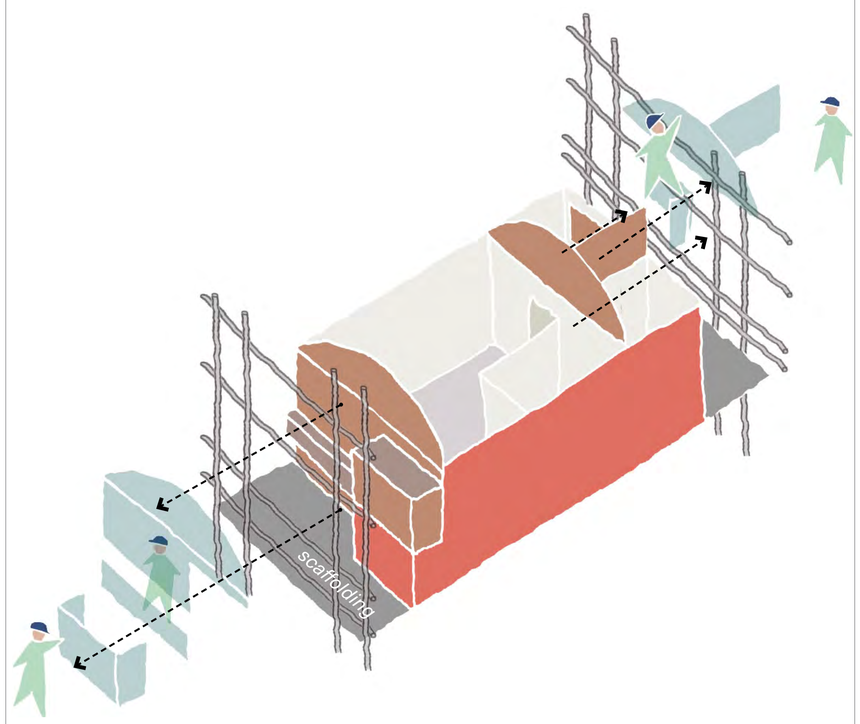
3
New vacuum glass installed, surrounding areas made good
2-3 weeks

Glass manufacture & delivery lead-in time
16 weeks



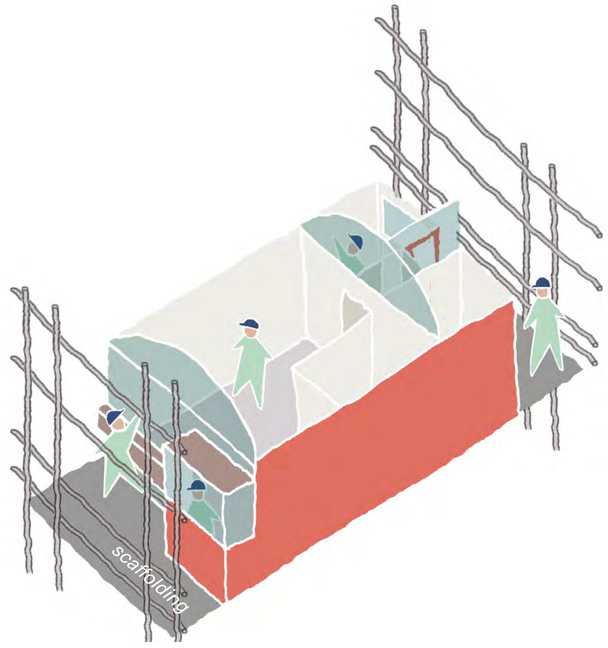
1
Install scaffold
Temporarily remove existing glass to template for new vacuum glazing
Measure glass and place order
Establish extent of repair needed for the frames and estimate programme for the repair works
Put existing glass back in

MEASURE



2
Strip decorations on existing frames, remove the existing glass and opening casements, and repair damaged frames to coincide for them to finish at the time of the glass delivery
Replace any damaged sections of frame that cannot be repaired
Insert new perimeter seals into opening lights
Redecorate frames

REPAIR



3
Install new vacuum glass and beads
Make good decorations to surrounding areas

NEW GLASS