

File Note

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Prepared by Richard Morgan
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8 Fitzroy Street London W1T 4BJ United Kingdom
t +44 20 7636 1531 d 02077552666
arup.com

Summary

The windows at 1 & 2 Stephen Street were installed in 1980 when building regulations did not promote building energy performance as they now do. Although the building has been well maintained, the windows within the existing façade have degraded over the last 40 years. The result is a building with windows that have a significantly worse performance when compared to modern standards.

Replacing the windows with a modern equivalent will save considerable energy in the following ways:

- Reduced heating load through improved insulation
- Reduced cooling load through better solar performance glass and better insulation
- Reduced electrical load through better daylight levels and the dimming of artificial lighting this allows.

Based on initial energy modelling it is estimated that the replacement windows will move this building from an EPC C to EPC B. The window replacement will generate an annual energy saving of 165,000kWh and save approximately 22 tonnes CO₂ per year.

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Existing façade

Daylighting - The existing windows are heavily tinted which offers good solar performance (i.e. reduced cooling load) but poor daylighting meaning artificial lighting cannot be usefully dimmed.



Figure 1 Existing façade

Thermal performance – The existing windows and walls have a U-value of around $3\text{W}/\text{m}^2\text{K}$ which is measure of the amount of heat that can pass through the façade construction. Current building regulations limit new facades to less than half this amount.

Replacement façade

To improve the performance of the building, new windows are is proposed. Glass technology now allows better solar control than the existing but still allowing good levels of daylight to penetrate into the building. Using this glass in the new windows will facilitate daylight controlled lighting which will reduce energy loads.

Similarly glass technology now has better thermal performance which when combined with increased thermal insulation in the spandrel panels and better thermal breaks will significantly reduce heat lost in winter.

Energy modelling results

Initial energy modelling has indicated that an improvement of one EPC band is expected. For the recently refurbished floors in the building an EPC C will improve to an EPC B. For the remainder of the building the improvement will be from an EPC E to an EPC D.

For operational energy the window replacement will generate an annual energy saving of 165,000kWh and save approximately 22 tonnes CO₂ per year (based on current grid carbon and the assumption that central plant is changed to ASHP as planned - this would be subject to a separate future planning application).