12 Bedford Square WC1

Windows

Design and conservation assessment

for The Bedford Estates

Anthony Walker
Dip arch.(dist), grad dip (cons) AA, RIBA, AABC

3673 February 2012

1.0 **Site**

1.1 The building is located at the north east corner of Bedford Square at the junction with Gower Street where there is a pedestrian crossing. See Site location plan.

1.2 The building has a basement with ground and three upper floors. It faces both Bedford Square and Gower Street.

1.3 The site lies within the Bloomsbury Conservation Area sub area 5 and is listed grade I.

1.4 A lease to number 12 was granted for 99 years to Nathaniel Sanderson, mason, on the 1st June 1781. Of particular interest is the 19th century tented balcony on the first floor which is one of at least three which were originally introduced but is the sole surviving example. The original leases made an unusual and specific provision to allow the first floor windows to be extended down to floor level and it is probable that this was done when the balcony was introduced.

1.5 The front elevation to Bedford Square has three bays with a five bay return to Gower Street of which the first two blank bays are blank followed by two with windows and a back wing at basement and ground level.

2 **Current situation.**

2.1 The building is currently empty despite attempts to let it and has suffered significant vandalism. It is understood that the difficult in letting is at least in part due to the high noise levels in Gower Street which affect the rooms on both faces. There is no secondary or double glazing.

APPENDIX A

2.2 Consent has already been granted for the installation of air handling units to improve the internal conditions and it is planned to carry out reinstatement of the damage caused to the building. Applications 2010/5036/P and 2010/5050/L

2.3 The Bedford Estate, owners of the property, wish to overhaul the windows with a view to improving the acoustic and environmental performance so as to enable the building to be relet and avoid further damage to the property. An application to install secondary glazing provided by Selectaglaze was refused and it is recognised that the general installation of secondary systems is problematic, however in view of the continued difficulties in letting the property it is considered essential to find a means of improving the performance of the existing windows while maintaining their historic interest.

3 **Consideration of the windows**

3.1 The windows are six over six panel sash windows with exception of the third floor which have three over three panes. The ground, first and second floors have working shutters contained within boxes at the side. The third floor had vertical sliding sashes which have been removed some while ago.

3.2 None of the windows have any weather stripping and all need varying degrees of maintenance to provide smooth operation.

3.3 Glass. Nearly all the glass is modern with a few panes of industrial glass and some apparently handmade glass on the first floor of which at least one panel has been broken at low level.

3.4 The initial impression is that most of the windows are from a similar period, however more detailed examination shows that there are varying mouldings both for adjacent windows and within individual windows. In some cases a cavity or reeded profile is used while in others an ovolo or ogee moulding is adopted. The sash frame depth is around 44mm but the glazing bars vary from 15mm on the second floor to generally 20mm with some of 24mm on the first floor where as noted above the windows have been changed to create full height windows leading onto the balcony. The slimmer sections would be more typical of the period of the building and reflect the sections from Bedford Square held in the Brooking Collection.

3.5 There is a single window at each level at the back on the northern façade which either provides light to the main staircase or at upper levels to lavatory accommodation. As these are environmentally non critical areas it is not proposed to make any alterations to these other than to provide weather stripping.

3.6 Ground floor
Bedford Square elevation. Later sashes with 24mm wide, ovolo glazing bars of poor quality. No evidence of hand made glass.
APPENDIX B

Gower Street elevation. Glazing bars 20mm wide, mixed ovolo and cavetto with bead glazing bars which appear to have been inserted in earlier frames. No hand made glass.
APPENDIX C

3.7 First floor
Bedford Square elevation. Glazing bars 24mm wide, ovolo glazing bars. Sash mouldings do not match box mouldings. One or two panes of hand made glass and some industrial glass.
APPENDIX D

Gower Street elevation. Glazing bars 20mm wide, ovolo glazing bars. Some hand made glass.
APPENDIX E

3.8 Second floor
Bedford Square elevation. Glazing bars to one window 17mm wide, cavetto with bead glazing bars, some hand made glass. Two windows are later replacements with 24mm ovolo glazing bars of lower quality.
APPENDIX F

Gower Street elevation. Glazing bars 17mm wide, cavetto with bead glazing bars with some panes of hand made glass.
APPENDIX G

3.9 Third floor
Bedford Square elevation. Later sashes with 24mm wide, ovolo glazing bars very poor quality and evidence of previous repairs. No hand made glass.
APPENDIX H

Gower Street elevation. Later sashes with 24mm wide, ovolo glazing bars, poor quality. No hand made glass.
APPENDIX I

3.10 Basement
Bedford Square elevation. Glazing bars 20mm wide, ovolo glazing bars
APPENDIX J

Gower Street elevation. Glazing bars 20mm wide, ogee glazing bars
APPENDIX K

4 Proposals

4.1 Consideration has been given to a number of ways of improving the efficacy of the windows in reducing the amount of external noise. One possibility would be to provide secondary glazing systems as previously proposed fixed inside the existing window frame line. However with the exception of the third floor even though this would be fully reversible its impact on the working shutters is considered to be unacceptable and is not proposed as a solution.

4.2 It is recognised that some improvement can be achieved by taking each sash out, building up the sash frames where necessary to improve the fit and installing weather stripping set into grooves in the frames. This would be basically in accordance with English Heritage *Draughtproofing and secondary glazing Framing Opinions Leaflet 1* which is mainly concerned with thermal performance.

4.3 However to achieve acceptable levels of acoustic control consideration has to be given to improving the performance of the glazing itself. A thicker glass (increase from 4mm to 6mm) would only make an improvement in the order of 2db which would not be discernable. A thin double glazed unit would significantly improve this but requires a larger rebate.

4.4 An alternative is to use a laminated material with an acoustic interlayer. There are several products including Pilkington Optiphon or Histoglass Insulating laminated glass which for a similar thickness would provide a significant improved decibel reduction in the order of 5db which is a clearly discernable reduction. Copies of the technical information from both companies is attached. The Optiphon laminated panels rely on a .76mm film to provide the necessary insulation between the outer and inner panes which gives an overall thickness of 6.8mm. In special situations a hand made external pane can be used which due to irregularities may slightly increase the thickness. Examination of the frames has shown that this can be accommodated with a minimal increase in the depth of the existing rebate. This work can be carried out when the frames are taken out for the repair and thermal upgrading described in 4.2 above.
APPENDIX L

4.5 In order to confirm that this is feasible retaining the existing joinery a specialist sash window repair company has been asked to examine the windows and provide a report which is attached and confirms that a laminated glass system is practical. The rebate for the new glass would need to be increased by approximately 3mm which the specialist has confirmed can be carried out on site.
APPENDIX M

4.6 The proposed works for the ground, first, second and basement windows comprise taking out and overhauling the sashes, fit draught excluders, reglaze with laminated panes using panes with hand made glass for the first floor windows to the balcony.

4.7 On the third floor where the windows have lost the vertical sliding shutters and have a plain internal lining there are two possible courses. The first is to install

secondary glazing using Selecta Glazing units which would be fully reversible and the glazing bars would follow those on the retained external windows in accordance with the recommendations in the Georgian Group Guide 1 Windows which confirms that this is an acceptable means of improving performance and preferable to the insertion of individual double glazed panes. However having considered the general condition of the windows at this level and that they are modern replacements of no historic significance it is proposed to retain the box frames and replace the sashes with new frames using a cavetto section to match that on the second floor with draught stripping and laminated glazing.

5 Impact on the significance of the heritage assets

5.1 The frames of the windows and the joinery of the sashes will present the same profile as existing when viewed face on. There will be a slight change in some instances in the depth of the rebate however as there are already significant variations in the profiles used even on adjoining windows or sashes within the same window this will not be discernable.

5.2 On the third floor and Bedford Square elevation where the later Victorian replacement sashes are in poor condition it is proposed to install new sashes to match the Georgian windows below. It is considered that this will enhance the appearance of the windows overall.

5.2 Most of the existing glazing is with modern glass and there will be no difference in appearance.

5.3 There are a few existing panes of hand made glass and it is proposed to use a hand made glass for the replacement panes for the three main windows facing Bedford Square thereby enhancing the appearance of this façade and providing a more durable glass less prone to damage.

5.4 As part of the remedial works the existing paint lines which have spread several millimetres on either side of the joinery will be removed and a neater finish will be achieved thereby enhancing the appearance of the windows.

5.5 The frames will retain all the historic joinery including the variations in profile which add to the interest of the windows. The sash boxes and shutters will be retained as existing.

6.0 Conclusion

6.1 The proposed works are substantially necessary maintenance and repair to the existing windows. The proposed weather proofing and reglazing will significantly improve the environmental performance of the windows and the safety of the glazing in resisting low level impact damage.

6.2 There will be no change to the appearance of the joinery and with a tidying up of the paintwork a neater and improved appearance of the windows overall will be achieved.

6.3 The box frames will be retained and only later sashes in poor condition at the upper levels will be replaced.

6.4 The related joinery in the form of the shutter boxes will be retained as existing.

6.5 The building will be repaired and brought back into use.

6.6 There is no adverse effect on the character or setting of the Conservation Area or the designated assets.

28 February 2012

APPENDICES

APPENDIX A

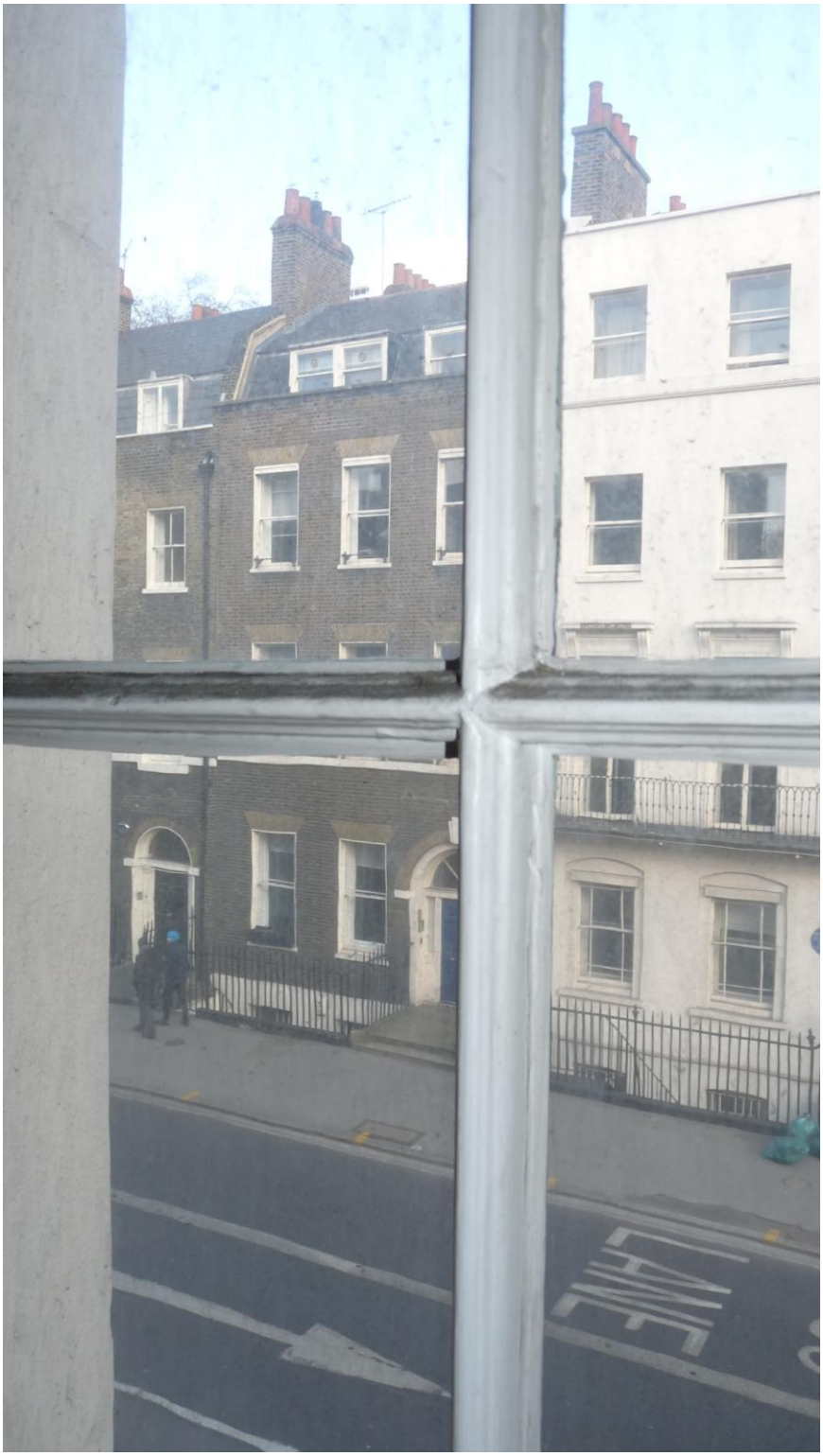
Current building condition due to vandalism

APPENDIX B
Ground floor Bedford Square – probable later sashes, 24mm ovolo glazing bars.

APPENDIX C
Ground floor Gower Street – simple ovolo glazing bars with square nose. External view shows sashes are a bad fit.

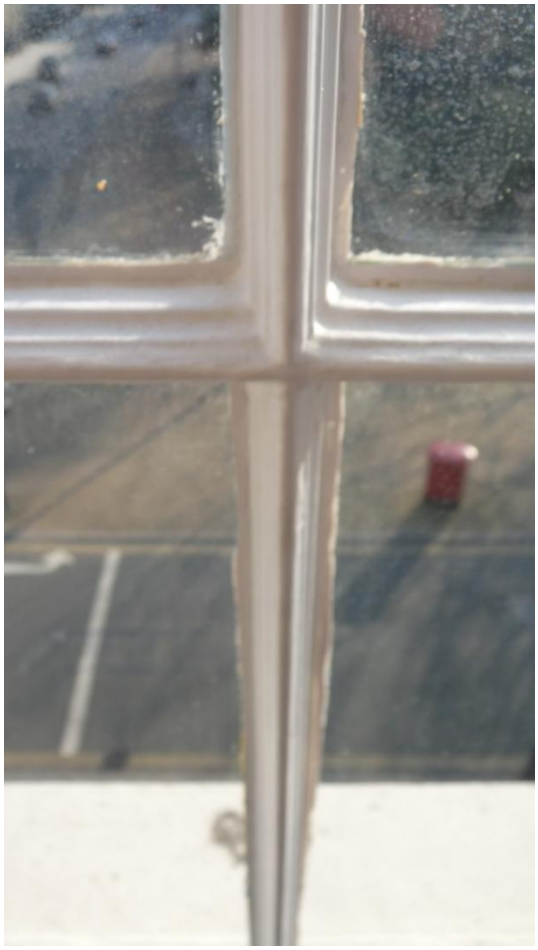
APPENDIX D
First floor Bedford Square – 20mm bars, cavetto mouldings with round bead nosing

APPENDIX E
First floor Gower Street – 20mm cavetto glazing bar with round nosing.



APPENDIX F

Second floor Bedford Square – varied glazing bars some ovolo bars with square nosing others cavetto with round nosing. Paint blurrs the appearance of the glazing bar.



APPENDIX G
Second floor Gower Street – 17mm cavetto glazing bar with the detail obscured by paint.

APPENDIX H

Third floor Bedford Square – windows in poor condition with ovolo bars and square nosing. Some frames are modern replacements.

Replacement sashes with crude horns to top frame.

APPENDIX I
Third floor Gower Street – modern window with standard ovolo glazing bar

Windows to Gower Street showing original vertical sliding shutters now removed and modern sash replacement window.

APPENDIX J
Basement Bedford Square – 20mm glazing bars.

APPENDIX K
Basement Gower Street- 15mm glazing bars with slight moulding.

APPENDIX L
Pilkington Optiphon and Histoglass laminated glass details

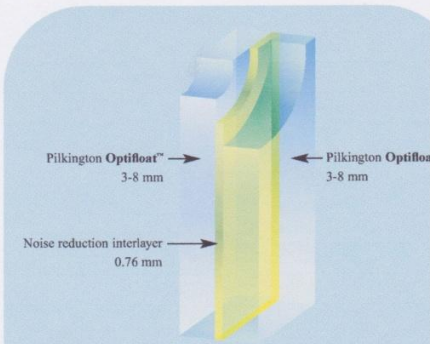
Pilkington **Optiphon**™
– Laminated glass for transparent noise insulation.

With increasing traffic on the road, rail and in the air, noise insulation has become a very important topic. It is not a question of it being a luxury anymore it is essential that noise reduction is considered in the specification of the glazing. With regard to employment law, comfort and medical necessity, noise insulation in building construction is an undisputed requirement to decrease stress- and noise-related illnesses.

Pilkington **Optiphon**™ is the ideal choice of glass in situations where there is excess noise from road, rail or air traffic, or various other sources, for example factories or nightclubs.

By using a special PVB (PolyVinyl Butyral) interlayer, Pilkington **Optiphon**™ is a high quality acoustic laminated glass that offers excellent noise reduction without compromising on light transmittance or impact performance.

The desired acoustic performance can be achieved through combining various thicknesses of glass with a PVB interlayer. With a large variety of product combinations, Pilkington **Optiphon**™ offers the opportunity to achieve specific noise reduction requirements.



NB: Pilkington **Optifloat**™ Clear or Tinted or Pilkington **Optiwhite**™ may be used

Benefits

- Special PVB interlayer for enhanced sound insulation performance
- A thinner and lighter glass for the equivalent acoustic performance
- Available in jumbo and lehr end sizes
- All products achieve at least safety class 1(B)1 (EN 12600) and are available to meet security glass grades contained in EN 356
- A high acoustic performance can be achieved when used in Insulating Glass Units (IGUs)
- Can also be used to improve noise insulation in a triple glazing construction

Pilkington **Optiphon**™ can be combined with other Pilkington products for a multi-functional noise-reduction monolithic glass or a multi-functional noise-reduction IGU providing additional benefits, such as:

- thermal insulation with Pilkington **K Glass**™ / / Pilkington **Optitherm**™ (coating in position 3 in IGU)
- solar control with Pilkington **Suncool**™ (coating in position 2 in IGU)
- self-cleaning with Pilkington **Activ**™ (coating in position 1 in IGU)

Histoglass

We're better, constructed.

MONO™

U-Value = 3.6 W/(m2*K)

Acoustic Insulation 35dB

Safety Pendulum Class 1B1 (BS EN 12600)

Safety P1A - P2A (BS EN 356)

Histoglass MONO™

Insulating Laminated Glazing

Technical

- Build-up with Genuine Machine Drawn Glass (9 mm):

  4 mm Low-E float - 2 mm film - 3 mm MD - 17.5kg/m2

- Build-up with Genuine Hand Drawn Glass (10 mm):

  4 mm Low-E float - 2 mm film - 4 mm GD - 20kg/m2

- U-Value =3.6 W/(m2*K)
- Acoustic Insulation 35 dB
- Safety Pendulum Class 1B1 (BS EN 12600)
- Safety P1A - P2A (BS EN 356)

Installation

Installation is similar to single glazing. The special film between the two panes of glass can corrode when in contact with certain materials. Histoglass therefore recommend installation using Kawo Elastokitt and cannot take any responsibility for damage due to incorrect installation or the use of incorrect products. When bedding the units, the whole edge should be completely enveloped by Kawo Elastokitt. For putty, regular linseed based products can be used. The Hand Drawn Glass should be installed to the outside.

Cleaning

Cleaning should be carried out using only regular domestic cleaning products. Do not clean with abrasive cleaning products, scouring pads or mechanical cleaning methods. Mechanical cleaning can cause black lines to occur on the glass, which cannot be removed. When wet, the panes can show a rainbow effect which will disappear again when dry and, as such, does not constitute grounds for a claim.

APPENDIX M
The Sash Restoration Co. Report following inspection on 1st February 2012

Anthony Walker
DLG Architects LLP
128 Southwark Street
LONDON
SE1 0SW

2nd February 2012

Window Survey of 12 Bedford Square.
(Survey undertaken on 1st February 2012)

Objective:
To assess the possibility of improving the acoustic efficiency of the original single glazed Georgian box sash windows within the limited restrictions on Grade I Listed Buildings.

Basement – Gower Street
3 x six over six original box sash windows. These windows have 15mm original glazing bars with a small ogee moulding. There is no evidence of any original hand blown glass.

Proposal:
Replace all glass with 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels). Full draught stripping (sound reduction approx. 4 decibels).

Basement – Bedford Square
2 x six over six box sash windows. These windows have 20mm glazing bars (these particular bars seem to be replacements within the original Georgian sash frames). There is no evidence of any original hand blown glass.

Proposal:
Replace all glass with 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels). Full draught stripping (sound reduction approx. 4 decibels).

Ground Floor – Gower Street
2 x six over six box sash windows. These windows have 20mm glazing bars (these particular bars (reed & hollow moulding) seem to be replacements within the original Georgian sash frames). There is no evidence of any original hand blown glass.

[1] Pilkington Optiphon is a high quality acoustic laminated glass that offers excellent noise reduction without impacting on light transmittance or impact performance.

1 x six over six box sash window. This window looks like an original Victorian addition. It has 22mm glazing bars with a typical Victorian Ovelo moulding. There is no evidence of any original hand blown glass.

Proposal:
Replace all glass with 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels).
Full draught stripping (sound reduction approx. 4 decibels).

Ground Floor – Bedford Square
2 x large six over six box sash windows. The original Georgian frames have been replaced with poor quality Victorian sash frames with 24mm glazing bars with Ovelo mouldings. There is no evidence of any original hand blown glass.

Proposal:
Replace complete sash frames with detailing in the Georgian style and incorporate the 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels).
Full draught stripping (sound reduction approx. 4 decibels).

First Floor – Gower Street
3 x large six over six box sash windows. These windows have 20mm glazing bars (these particular bars (reed & hollow moulding) seem to be replacements within the original Georgian sash frames). There is some evidence of original hand blown glass.

Proposal:
Replace all glass with 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels).
Full draught stripping (sound reduction approx. 4 decibels).

First Floor – Bedford Square
3 x large six over six box sash windows. These windows have 20mm glazing bars (these particular bars (reed & hollow moulding) seem to be replacements within the original Georgian sash frames). There is some evidence of original hand blown glass.

Proposal:
Replace all glass with 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels).
Full draught stripping (sound reduction approx. 4 decibels).

Second Floor – Gower Street
3 x original Georgian six over six box sash windows. These frames have 17mm glazing bars with reed & hollow moulding. There is some evidence of original hand blown glass.

Proposal:
Replace all glass with 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels).
Full draught stripping (sound reduction approx. 4 decibels).

Second Floor – Bedford Square
1x original Georgian six over six box sash window. These frames have 17mm glazing bars with reed & hollow moulding. There is some evidence of original hand blown glass.

Proposal:
Replace all glass with 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels).
Full draught stripping (sound reduction approx. 4 decibels).

2 x six over six box sash windows. The original Georgian frames have been replaced with poor quality Victorian sash frames with 24mm glazing bars with Ovelo mouldings. There is no evidence of any original hand blown glass.

Proposal:
Replace complete sash frames with detailing in the Georgian style and incorporate the 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels).
Full draught stripping (sound reduction approx. 4 decibels).

Third Floor – Gower Street
3 x three over three box sash windows. The original Georgian frames have been replaced with poor quality Victorian sash frames with 24mm glazing bars with Ovelo mouldings. There is no evidence of any original hand blown glass.

Proposal:
Replace complete sash frames with detailing in the Georgian style and incorporate the 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels).
Full draught stripping (sound reduction approx. 4 decibels).

Third Floor – Bedford Square
1 x three over three box sash window.
1 x double box sash window (three over three x three over three).
Both are in very poor condition and appear to be Victorian replacement sash frames with 24mm glazing bars with Ovelo mouldings which have already undergone considerable poor quality repairs. There is no evidence of any original hand blown glass.

Proposal:
Replacement double glazed box sash windows in the Georgian style.

Alternative Proposal:
Replace complete sash frames with detailing in the Georgian style and incorporate the 6.8mm Pilkington Optiphon[1] (sound reduction approx.7 decibels).
Full draught stripping (sound reduction approx. 4 decibels).

Yours sincerely,

Ronnie Salisbury.
Managing Director