CHAPTER 3

The Proposals

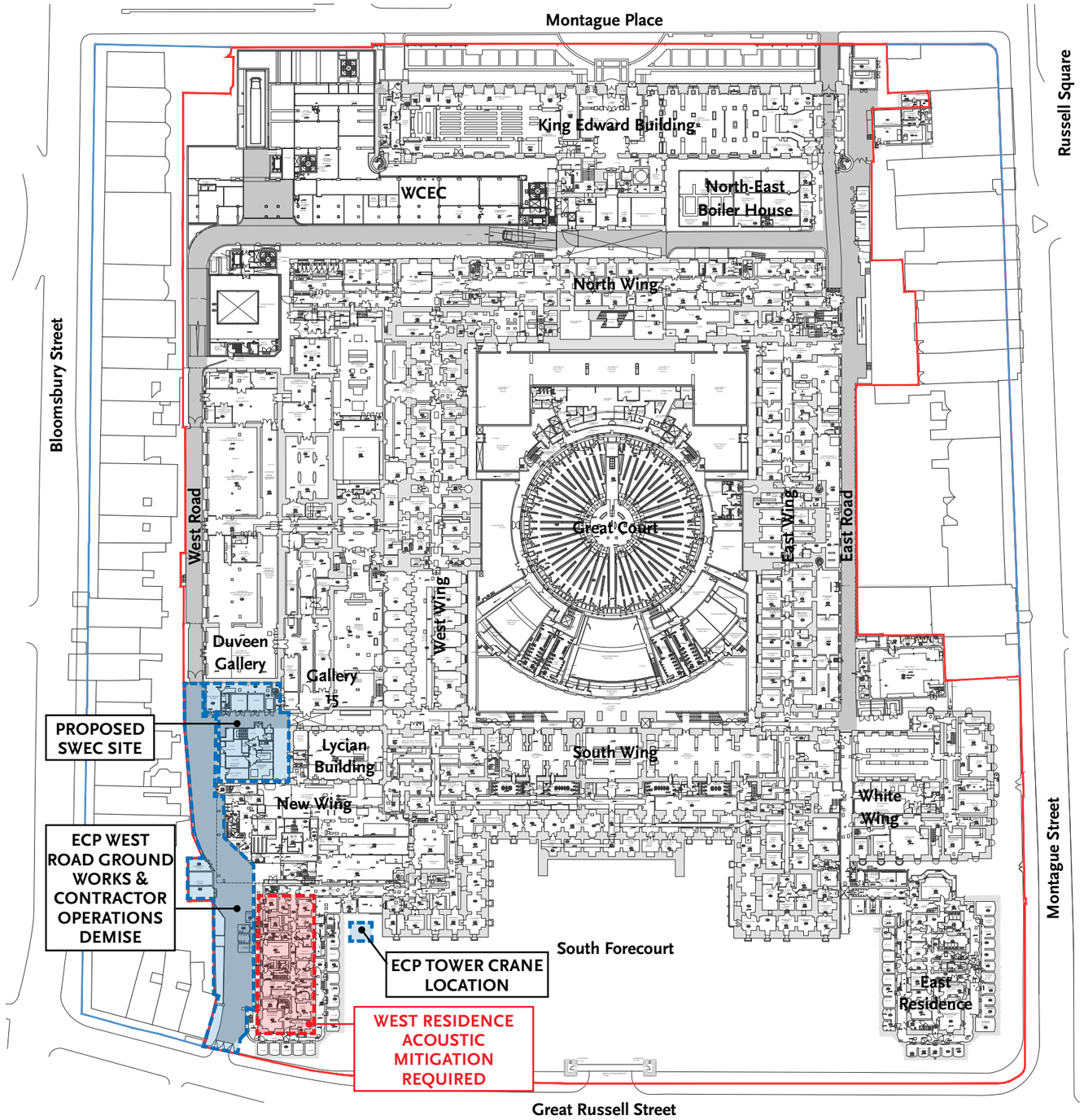
3.1 Overall Proposals Scope

In summary the proposals for the West Residence are to install 15 units of secondary glazing at Level 05. The installation of these units is required to ensure the spaces remain occupiable and therefore the functions within them can be maintained. These functions support critical operational functions in the Museum and the Museum's front of house visitor experience.

The proposals are for installation of the secondary glazing units and other sundry works on a temporary basis only during the ECP construction period. Upon ECP completion the secondary glazing will be removed and required repairs will be sensitively undertaken to restore the existing status quo.

The proposed locations for installation have been determined through a case by case analysis rather than a blanket approach, but naturally are in areas directly adjacent to expected ECP construction activity (and the additional noise this will generate), as illustrated in the adjacent diagram. Intervention has only been proposed where there is a demonstrated need and where other mitigation measures such as management procedures are not suitable. As such, the proposals represent the minimal interventions required in order to ensure critical operations and functionality of the Museum is maintained.

For further description of the needs case and determination of extent of proposed secondary glazing achieved through specialist acoustic survey and analysis, please refer to Chapter 1 of this document.



Key:

Planning Application Red Line Boundary

Other land in applicants ownership

Right:

Level 02 plan of the Museum Estate showing the location of the development site and relevant existing buildings

3.2 Historic England Guidance

In July 2024 Historic England published "Adapting Historic Building for Energy and Carbon Efficiency: Historic England Advice Note 18 (HEAN 18)".

The advice note was produced to "provide clarity - in support of consistent decision making - on approaches to improve the energy efficiency and support carbon reduction of historic buildings, whilst conserving their significance".

Within section 4 the advice note states:

- *Installation of secondary glazing to the windows will generally be acceptable.*

- *In most cases, the impact of its installation on significance will only cause minimal harm to historic fabric and architectural interest, which will generally be acceptable in view of the benefits obtained.*

- *Exceptions may include interiors of exceptional architectural quality (such as the finest state rooms of a great house), buildings with historic shutters which would be damaged or rendered inoperative by the installation, and buildings with glazing of exceptional significance which should not be obscured. In many of these cases, temporary secondary glazing used seasonally will generally be acceptable.*

- *Listed building consent is unlikely to be required for all other secondary glazing works.*

- *Secondary glazing can provide very effective draughtproofing as well as improved thermal efficiency.*

- *Secondary glazing will provide considerable improvements to thermal performance and energy conservation. In respect of multipane windows, it often outperforms double-glazing.*

These proposals align with this guidance, in that their installation will improve acoustic environmental performance, but also draughtproofing and energy performance of the fabric for the duration of their install. They are proposed to be temporary in nature for a set period, in a similar fashion to the seasonal temporary glazing considered gerenally acceptable even in exceptional circumstances of architectural quality.

Right:

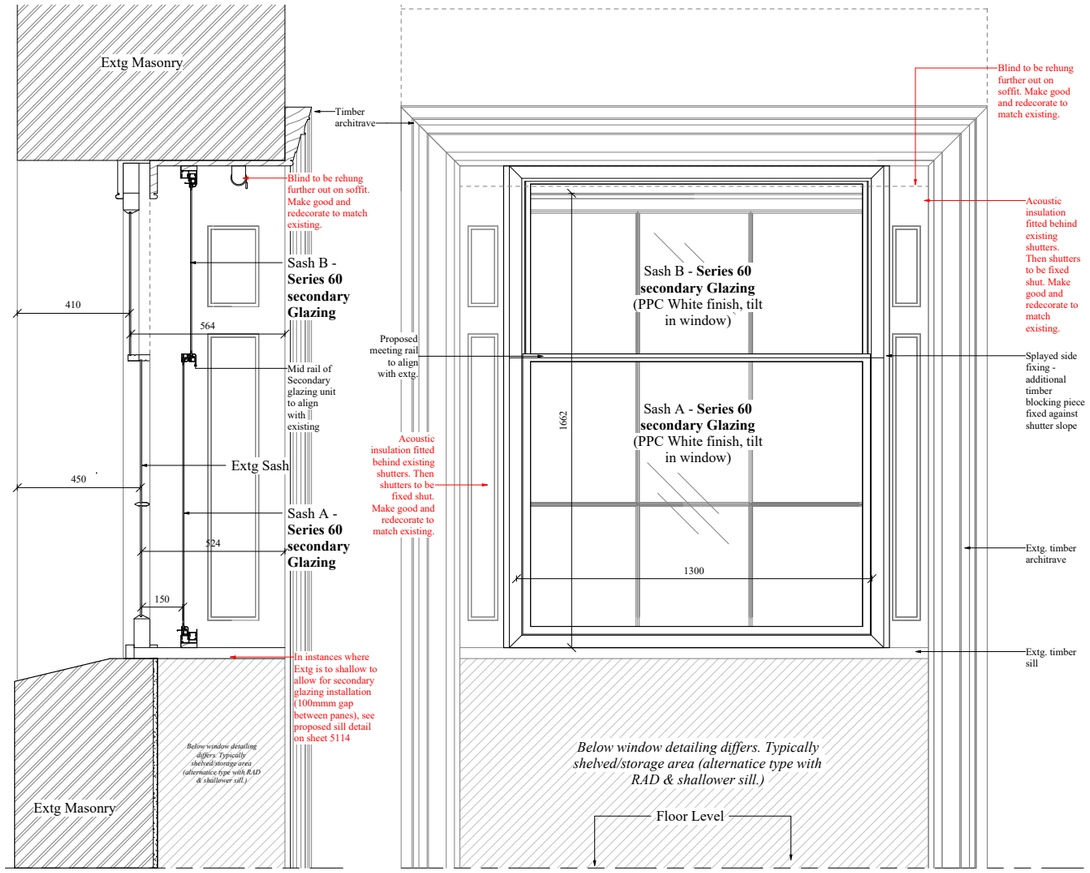
Front cover of the Historic England's "Adapting Historic Building for Energy and Carbon Efficiency: Historic England Advice Note 18 (HEAN 18)", publshed July 2024. Copyright Historic England

3.3 Detailed Drawings & Schedule

It should be noted that this chapter provides an illustrated summary of the works only. It is intended to be read in conjunction with, and not a replacement for, the full detailed drawings and schedule contained within the application documents.

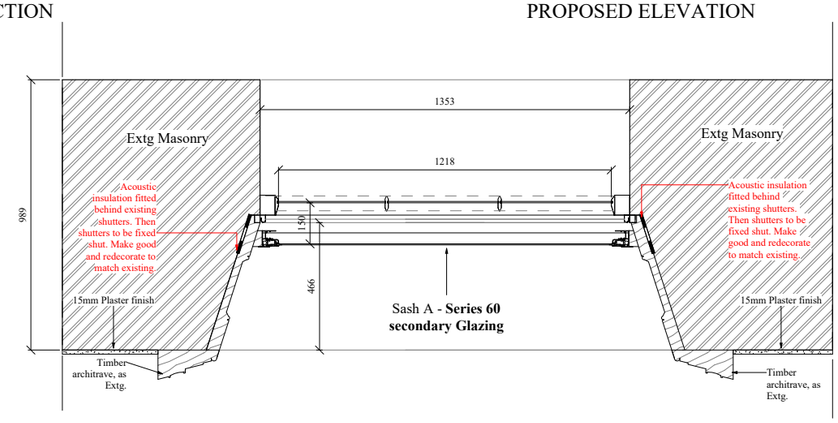
The drawings show existing and proposed plans, sections, and elevations at 1:10 scale for each window type condition, along with accompanying scoping and type drawings. The accompanying window schedule contains key specification information such as sizing, window product specification, finish, works to existing elements required, referenced back to the window type and drawing number reference within the detailed drawing pack.

Reference should be made to this information for a full and detailed understanding of the proposals.



PROPOSED SECTION

PROPOSED ELEVATION



PROPOSED PLAN

Right:

Proposed detail plan, elevation, and section drawing of secondary glazing type G installation within the West Residence.

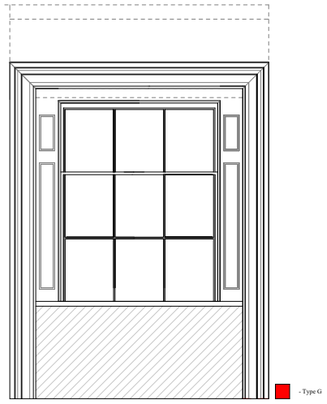
3.4 West Residence Scope

The proposals for the West Residence are to install 15 units of secondary glazing at Level 05 in the locations indicated in red on the adjacent plan. The existing windows are all of the same type and the proposed use of an aluminium frame in a PPC off white finish to match existing internal paintwork.

The new frame provides a total elevational sill, jamb, and head profile of 75mm, with an internal 'sash' transom profile of 28mm. The new frames would present two glazed panes with transom between aligned to the existing. The new unit is a vertical sliding unit but can also tilt in to allow for adequate cleaning and access.

The new unit requires an offset from the internal face of existing sash unit in order to achieve the required acoustic performance, meaning the existing timber shutters will have to be pinned and window fixed through the shutter, pinned shutters being found in some locations already in the existing condition. Once removed, sensitive repairs will be undertaken in situ as described later within this chapter.

Reference should be made to the detailed drawings and schedule contained within the application documents for further information.

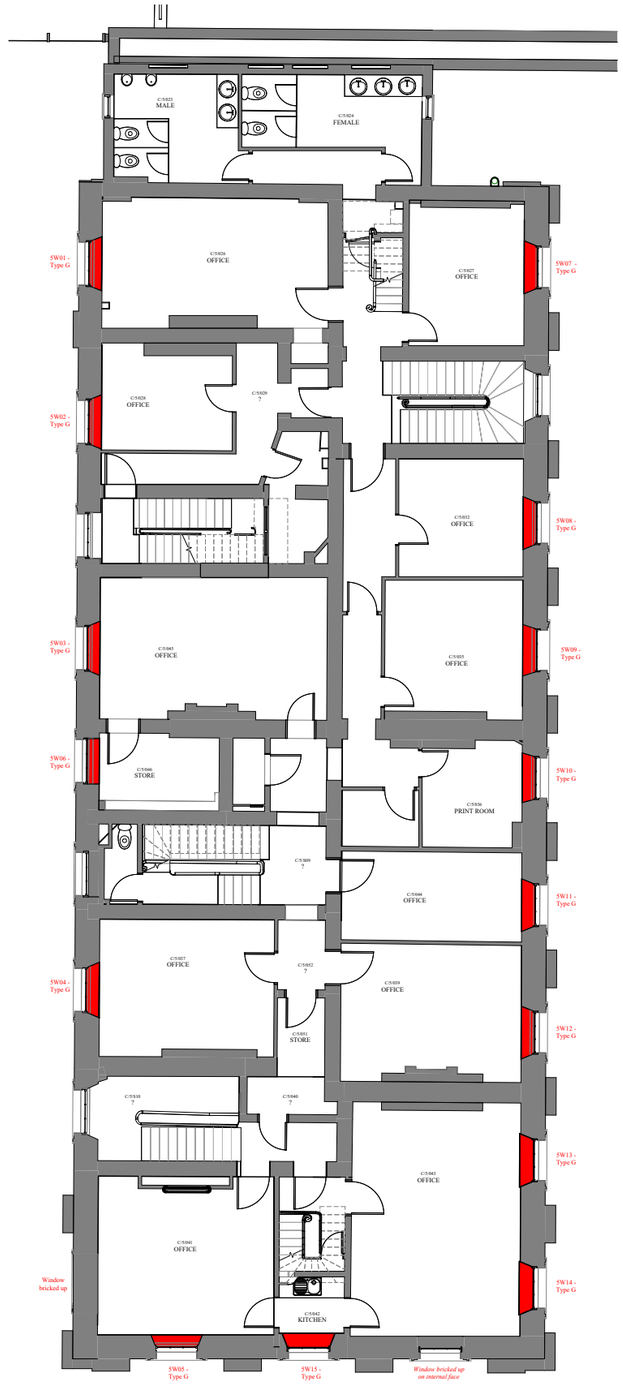


10 Type G
1 : 20

Existing Window Arrangement Notes:
West Residence sash windows, white painted timber finish, radiator below and sloping shutters (below window detailing changes as per schedule)

Proposed Secondary Window Finish
PPC - White

Number of instances
15



Key:

S.Glazing Type G

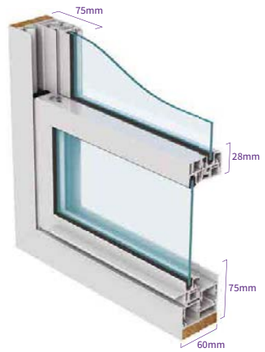
Clockwise from top left:

Type G existing window elevation

Scoping plans indicating the location and number of secondary glazing units proposed to be installed within West Residence L05

photograph of existing window

CGI showing the proposed secondary glazing section type.



SERIES 60 VS

- Type G

3.5 Selected Window Types

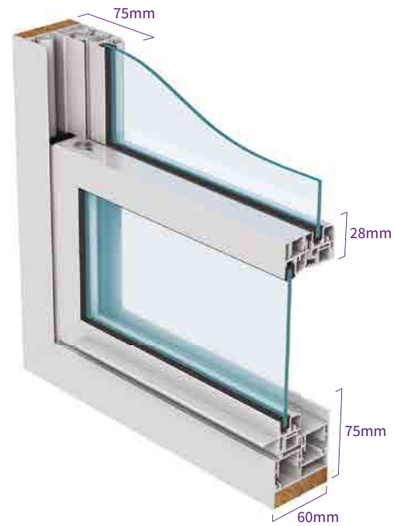
The proposed secondary glazing windows are all proposed to be sourced from the same manufacturer, with a reputable reputation and track record of delivery and installation in sensitive heritage environments and listed buildings. A summary of the type proposed and some precedent photography provided by the supplier is provided adjacent.

- The Series 60 unit is an aluminium framed vertical sliding sash unit which also possesses the ability to open the panes via an internal tilting action. This provides flexibility for cleaning and access where sash panes are not of equal height

Reference should be made to the detailed drawings and schedule contained within the application documents for further information.

SERIES 60 VS

- Type G



Top:

CGI showing the proposed secondary glazing section types

Bottom:

Precedent images of the proposed secondary glazing types, each photo corresponds to the CGI above. Courtesy of Selectaglaze.

3.6 Proposed finishes

With regards to finishes, full reference should be made to the window schedule, however within the West Residence all new windows are proposed to be finished in a PPC off-white colour matching the existing window and surround paintwork found on site.

PPC RAL 9010

- ‘Standard’ finish for other windows throughout, where internal shutters and trims are typically painted in a matching off-white colour.

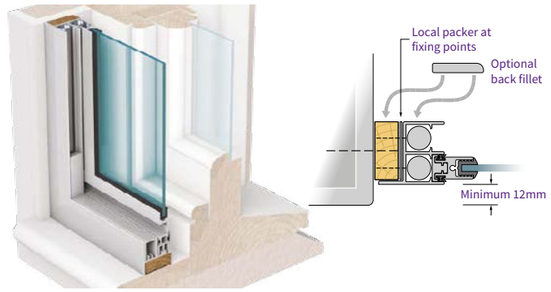
Left to right:

Photographs of swatch sample of the proposed paint finish and corner sample of secondary glazing against existing painted shutters and trim to existing windows

3.7 Proposed Fixing Details

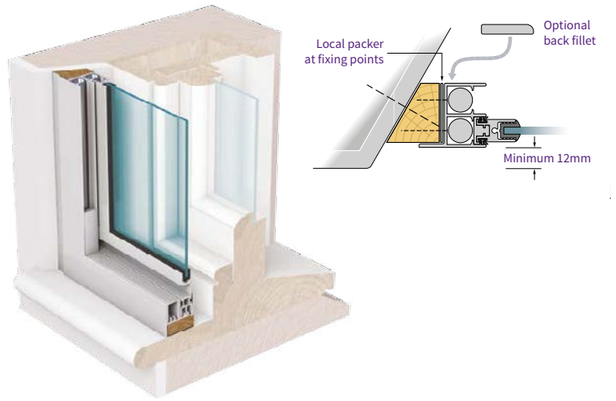
Illustrations and descriptive text is provided adjacent and on the following page to describe the nature of the proposed fixings required to safely secure the secondary glazing units in place.

Further detail as to the fixing methods is also provided on the following page.



Standard square reveal fix

- 33mm x 15mm twice primed softwood ground bedded in acrylic sealant and fixed to structure
- Odd leg frame with applied sealant is conceal fixed to ground
- Local hidden packers take up opening tolerance
- Optional caulking joint between frame and wall allows finished decoration



Splayed reveal fix

- Softwood timber machined to match the splay
- Odd leg frame with applied sealant is conceal Fixed to timber
- Local hidden packers take up opening tolerance

Top to bottom:

Selectaglaze Standard square fixing detail + CGI

Selectaglaze Splayed reveal fixing detail + CGI

Typical fixing detail for vertical sliding units into timber grounds shown below.

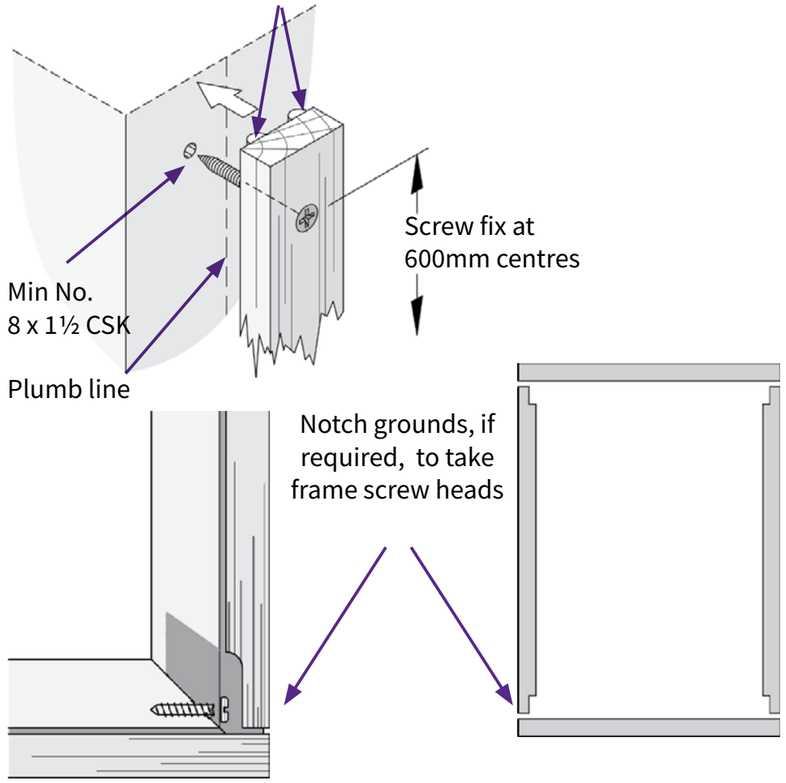


Image:

Typical Selectaglaze fixing detail

Fixing centres

- (Same across all types) *150-250 from light duty corners no greater than 600 mms*

Hinge centres

- (Same across all types) *177.5mm from corners no greater than 1000 mm less than 2300 unit height, no greater than 600 mm above 2300 unit height*

Fixing into Masonry

- Series 10, 20, 25, 30, 45, 47 &60 - Grounds; *Masonry nails, no6 (ø3.50) or 8 (ø4.20) screws and plug.* Frame; *no6 (ø3.50) screw hinges to be through fixed.*
- Series 90 heavy duty units - Grounds; *No8 (ø4.20) screws and plug*. Frame; *no8 (ø4.20) screws, hinges to be through fixed*

Fixing into Plaster board -

- Series 10, 20, 25, 30, 45, 47 &60 - Grounds; *plaster board fixing & no8 (ø4.20)*. Frame; *no6 (ø3.50) screws not hinged units*
- Series 90 heavy duty units - Grounds; *plaster board fixing & no8 (ø4.20).* Frame; *no8 (ø4.20) screws not hinged units*

Fixing into Timber panelling (series 90 Heavy duty units)

- Series 10, 20, 25, 30, 45, 47 &60 - Grounds; *no6 or 8 (ø4.20) screws*. Frame; *no8 (ø4.20) screws hinges to be through fixed.*
- Series 90 heavy duty units - Grounds; *no8 (ø4.20) screws*. Frame; *no8 (ø4.20) screws hinges to be through fixed*

3.8 Future repairs

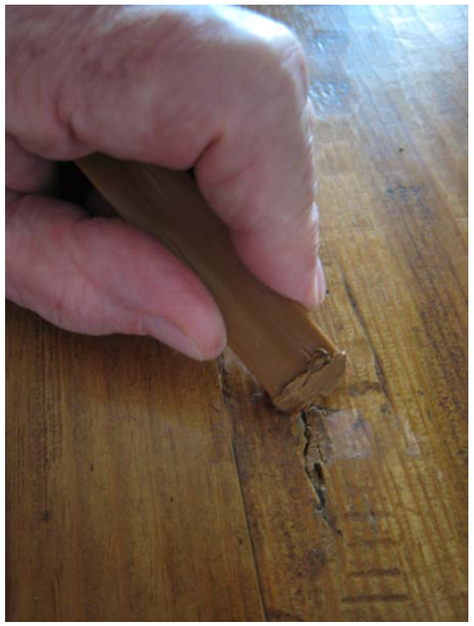
As noted earlier in this document, the proposed secondary glazing installations contained within this application are proposed as a temporary measure only as required to mitigate increased noise via construction through the Energy Centre Programme delivery period on site. Once this activity has been completed, the proposed interventions within this application will be reversed and the condition returned to the existing status quo. Where fixings into existing fabric are required to support the temporary installations, these will be repaired in-situ following SPAB guidance and methods.

For future repair of fixings locations:
Where repairing minor wear from screw fixings in timber panels, follow SPAB guidance and fill with hard, coloured wax.

Where repairing minor wear from screw fixings in plaster, allow for repair & repainting at point of fixing.

SPAB Guidance - 'How can you repair a split timber panel?'

Panels often split when they shrink but are prevented from moving within their framework, frequently due to paint accumulation. If freed, panels may be glued back together. Sometimes a timber spline is glued into the split (which may need widening) and planed flush with the panel face. The panel is held until the glue sets with temporary attachments clamped either side of the split or using suitable tape. Another option when dealing with painted panelling, and adopted at the SPAB's headquarters, is to cover splits with a fabric-based intumescent tape. ***Minor splits in panels might be filled with hard, coloured wax.***



Minor wear filled with wax

Excess wax removed

Surface polished/finished to match existing timber

Clockwise from top left:

Images showing process of wax filler repair to timber panelling, as per SPAB guidance.

3.9 Existing Window Repairs

The Museum holds a fabric condition survey completed in 2022, which assesses the condition of some, but not all, the windows contained within this application. The findings from the condition survey are summarised within the Window Schedule contained within the application documents.

The survey categorises recomended remedial works as either required in the short, medium, or long term. Short term works are typically associated with minor cleaning, replacement of cracked panes, or investigation of water ingress.

It is proposed that short term remedial maintenance work is undertaken as part of the proposed works if they:

- are applicable to the existing window unit itself, and do not require wider works to surrounding fabric such as external roofs or walls and;
- have not already been undertaken since the 2022 survey and;
- are able to be undertaken safely from the interior of the building (and therefore not require external scaffold and associated fixings into external fabric) and;
- are required to keep the window operational i.e. openable

For the avoidance of doubt, where remedial work to exsisting windows is undertaken, these will be undertaken on a like for like maintenance repair basis.

Prior to the secondary glazing units proposed being installed, a supplementary condition survey of the existing windows will be undertaken to include windows not assessed in 2022 as well as note any remedial works or further dilapidation that has ocurred since 2022.

If further short term remedial work is found to be required, these will be undertaken on a like for like maintenance repair basis if they met the stipulated criteria as bulleted above.

Finally, it should be noted that all of the proposed secondary glazing units are openable, and therefore provide access to the existing windows for cleaning and maintenance works throughout the period of is installation.

3.10 Other Considerations

Sustainability

The applicant is aware of the benefits that the proposed secondary glazing will bring not only with regards to acoustic perforamnce but also energy efficiency during the time of their install. These benefits are sumamrised further in recent Historic England Guidance note in section 3.2 of this chapter.

The project team has chosen proposed products which have high percentages of recyclability and also utilise recycled material in their making. The proposed product is 99% recyclable and the aluminium used made from 60% recycled material, the glass 35% from recycled material. The proposed supplier also notes their commitment to sustainability through:

• Minimising production waste using lean processing techniques
• Ensuring all timber and paper products are FSC certified
• Actively promoting reduction of waste and recycling
• Selecting vehicles with are ultra-low emission or as low emission as is practical encouraging safe and efficient driving
• Adopting strategies to reduce the environmental impact of business travel
• Monitoring and seeking ways to reduce energy
• Investing in energy efficiency measures for company premises
• Ensuring that fair procurement practices are applied and suppliers are paid on time
• Adhering to any Government recognized trading sanctions
• Avoid trading with suppliers which don't have the same social ideals

Condensation

There is a perception with secondary glazing that it may lead to an increased risk of condensation between the existing and new secondary glazing units.

The applicant has worked closely with the proposed secondary glazing manufacturer in developing proposals which mitigate this risk. This includes:

- Where existing radiators are present, locating the new secondary glazing unit so that the radiator is not contained within the cavity between the window units
- Not installing new brush seals to the existing outer windows - the secondary glazing manufacturer advised against this as the trickle ventilation provided through the existing historic window aids ventilation of the cavity
- Ensuring all installed secondary glazing units are openable to provide access for cleaning and maintenance to the cavity, but also allow for ventialtion to the cavity if required.

Shutters

HEguidance on secondary glazing notes:
4.3: Shutters
Where shutters or other joinery are present, careful thought will be required. Sometimes secondary glazing can be positioned between the primary window and the shutters so that the shutters still function.

Unfortunately, this is not appropriate in the cases within these proposals due the minimal space between the shutters and existing windows (a minimum offset is also required from the existing window to the secondary glazing unit to achieve the certified acoustic performance).

If the shutters are housed within the window reveal it may be possible to install secondary glazing on the room side of the shutters.

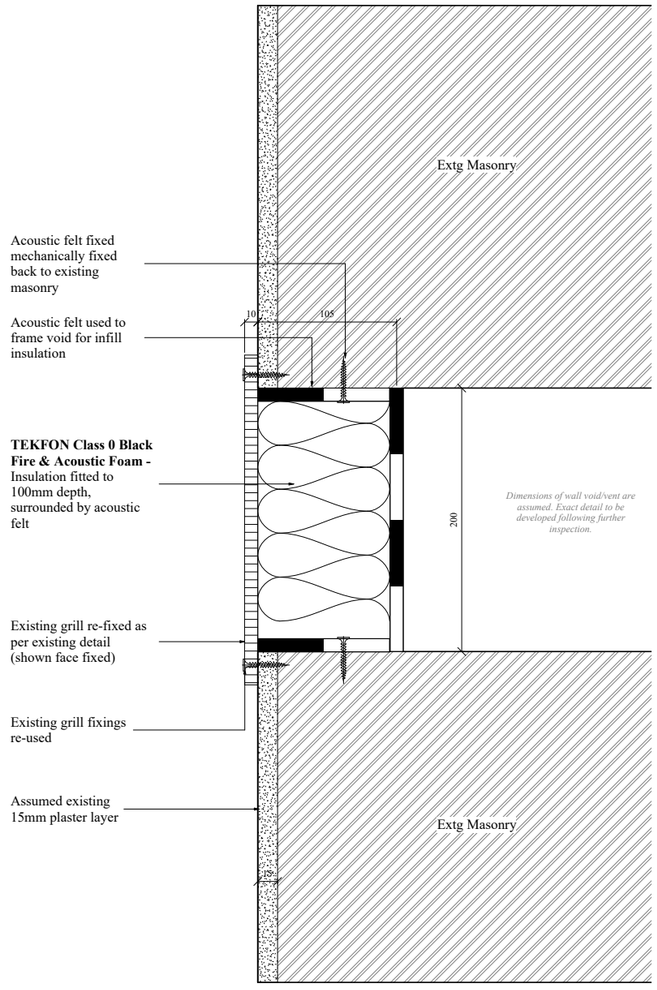
This is not desired within the proposals as the windows typically have decorative internal architraves which would be harmed, or have radiators within the shutter zone which would cause heating and condensation issues were it to be enclosed by the secondary glazing.

If the secondary glazing cannot be inserted without making the shutters inoperable the shutters could be fixed shut but not altered so that they can be brought back into use at a later date.

This is what is proposed within this application, where shutters will be carefully pinned back for the duration of the temporary units installation, and reinstated to use upon its removal.

3.11 Minor vent works

When undertaking photographic surveys on site, a number of internal metal grilles covering voids within the existing external walls where observed. The extent of the voids behind are not known, but there is a concern some may present the chance for noise to flank through the void into the interior space. Therefore, where these are present adjacent to the existing windows where secondary glazing is to be installed, the proposals allow for the existing decorative grilles to be carefully removed, and acoustic felt and foam to be placed within the outer section of the void, before the grille is carefully reinstated.



Right:

Typical detail showing internal face acoustic treatment.

3.12 Research into alternative products

As part of the design development, the use of alternative products was explored which would limit the extent of fixings required into existing fabric. These are described below and their limitations/ constraints which unfortunately render them unsuitable for the proposed application are noted.

Magnetic Window research

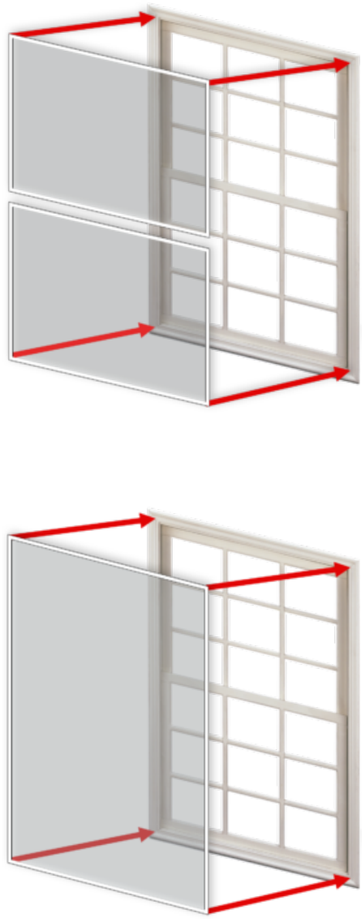
Magnetic 'clip on' style Magneglaze secondary glazing was explored, which minimises the use of mechanical fixings

Unfortunately, these units are not suitable as they only achieve a 10.4db reduction, where the project aims for a 35db reduction across all windows to achieve required internal noise levels as advised by Bickerdyke Allen & Partners.

Additionally the larger window sizes and curved head requirements are not able to be manufactured by this product range.

Furthermore, units cannot be opened for ventilation without being entirely removed, limiting occupants ability to attain some natural ventilation in times of lower external noise in summer months. Requirements for manual removal and storage also create further issues.

Finally, there was some concern as to the scars that would be left by adhesive used to stick the magnetic strips to the existing window frames, particularly where these are finished in stained timber.



Shown to the right:

Images showing typical applications of Magneglaze secondary glazing units

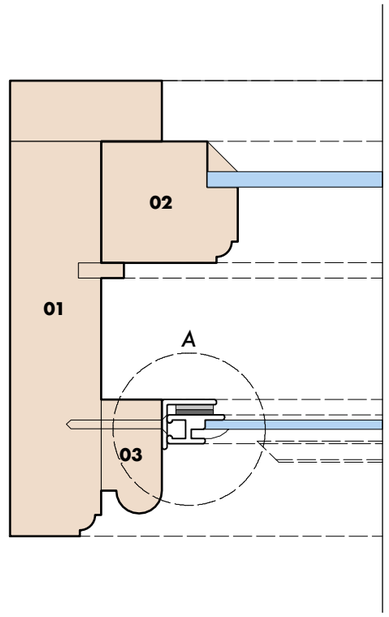
Storm windows

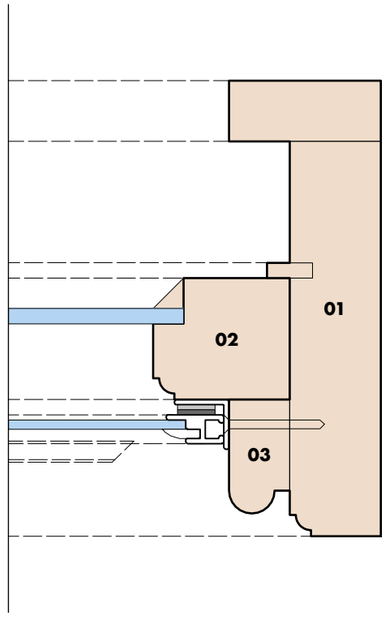
Storm windows, as used in the SPAB headquarters, are a 'hybrid system which combines magnetic and mechanical fixings.

The product still requires mechanical fixings into the existing fabric so is like-for-like in that regard to the proposed products contained within this application.

The proposals contained within this application are associated with proposals for installation of secondary glazing units within the White Wing and East Wing (for which seperate listed building consent applications have been made). It is the applicant's intention to procure and install the works across the three buildings as a single package through a single supplier.

As some of the units proposed for install within the White Wing and East Wing require either larger sizes or finishes that cannot be provided by Storm Windows, its was felt for consistency and security of warranty that the selectaglaze product was more suitable for use for the works contained within this application.





Top to bottom:

Typical Storm windows vertically sliding unit detail in plan, with L bracket mechanical fixing.

Typical applications, taken from Storm Windows website.