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Secondary Glazing

Victoria and Albert Museum



Benefit: Quieter
Type: Refurbishment
Listing: Grade I and II*

II* and Grade I Listed offices and galleries bordering the site, which were to remain fully operational throughout the entire build period.

Founded in 1852, The Victoria and Albert Museum is the world's largest museum of decorative arts and design, with a permanent collection of over 4.5 million priceless, delicate and irreplaceable objects and artifacts ranging from ancient times to the present day; from the cultures of Europe, North America, Asia and North Africa.

In recent years the Museum has benefitted from a major renovation programme. The latest phase is currently being undertaken by Wates Construction and involves the demolition of the old Boiler House Yard buildings to make way for the construction of a new underground exhibition space, a revamped open courtyard with cafe and an improved Museum entrance from the newly landscaped Exhibition Road.

However, before work could commence the Board of Trustees of the V&A commissioned acoustic consultants Bickerdike Allen Partners to conduct a study on the noise and vibration impact of the works to the Grade



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The study concluded that, prior to commencement of these works, it was essential to install acoustic secondary glazing to affected windows in order to provide acceptable working conditions in the offices.

Selectaglaze is the UK's leading designer of secondary glazing systems with considerable experience of working within Listed and period buildings and has full laboratory test reports for noise attenuation capabilities. The company was approached by the V&A Estate Office in 2012 to consider possible options and due to the sensitivity of the project, it was agreed to install samples in two rooms for assessment.

The subsequent specification required the secondary glazing to: 'Allow access to the primary windows for general maintenance and ventilation; be sympathetic to the style of existing windows without the introduction of new sightlines; glazing to be at least 6.4mm clear laminated glass' and for the secondary glazing to 'achieve a minimum noise reduction of 10dB - over and above the noise reduction provided by the existing windows'.

Based on this brief, and following Listed Building Consent, Selectaglaze was subsequently appointed to build over 60 window frames, in a range of styles. The largest in the Henry Cole Wing were 3.5m high and nearly 2m wide including arched heads. These were treated with heavy duty sash windows coupled

to a slim high level, arched fixed panel to ensure a sympathetic match. Each frame is purpose made with high performance seals that not only improve the acoustic insulation but also help reduce the passage of dust and dirt - which is a feature of all building sites. The bespoke frames were fully fabricated off-site, allowing rapid installation and completion ahead of the start of demolition works.

The work has exceeded the Museum's noise insulation expectations and an added benefit, reported by staff working within the treated areas, is a noticeable improvement in the thermal efficiency of the windows.

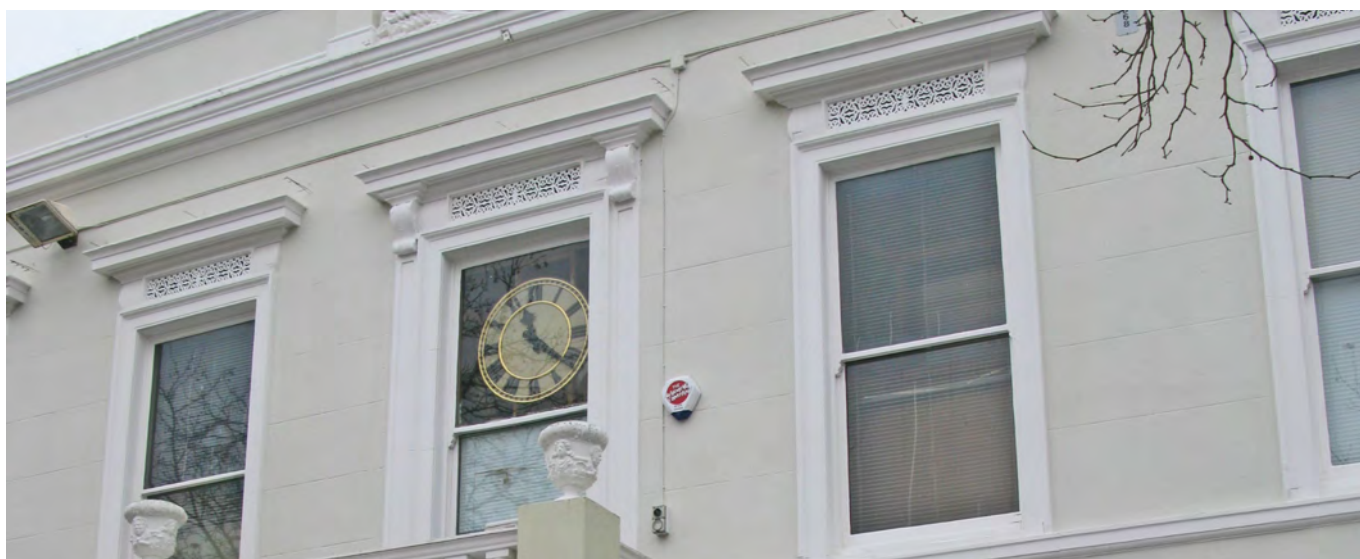
Founded in 1966, Royal Warrant holder Selectaglaze's products are fully tested and assessed for performance and twice yearly quality audits are conducted through the company's ISO 9001 accreditation with LPCB. An extensive range of literature and guidance notes covering acoustics, thermal performance are available.



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The Willis Museum



Benefit: Safer
Type: Refurbishment
Listing: Grade II

As part of an upgrade programme, Selectaglaze has installed its Series 80 'Secured by Design' accredited heavy duty horizontal sliding units incorporating central locks and anti-bandit glass.

Dating back to early 1800s, the building was originally Basingstoke's Town Hall. In the late 1800s it became The Mechanics' Institute providing a library, exhibition of art curios and lectures for those who had left school at an early age to seek work.

However, facing bankruptcy in the 1920s, the building was offered to the town council as a library and free museum.

Twenty years later it became The Willis Museum in honour of George Willis a local jeweller and philanthropist and former Basingstoke Mayor who was a prime motivator behind the building's reincarnation.

The Museum's exhibit now concentrate on the borough's architectural, industrial and community heritage from the 19th century through to the 1960s.





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Tate Liverpool



- Benefit:** Warmer
- Type:** Refurbishment
- Listing:** Grade I

Tate Liverpool is the home of the national collection of modern and contemporary art in the North of England. Attracting more than 12 million visitors since opening in 1988, Tate Liverpool is one of the most visited UK galleries outside London.

The gallery is housed within a five storey Grade I Listed warehouse, converted by architect James Stirling, in the historic Albert Dock on the city's World Heritage waterfront.

Tate Liverpool's commitment to sustainability has recently seen improvements to the gallery's conferencing areas on the fourth floor and the fourth floor galleries which host special exhibitions and displays year-round.

As part of their brief, Building Surveyors Drivers Jonas Deloitte needed to ensure that the gallery's environmental conditions were optimised to protect the works of art on display.

The large traditional single glazed windows overlooking the docks capture light throughout the day and so offer superb viewing conditions but also need to provide the required environmental conditions for the display of art works.



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To help find a solution, Drivers Jonas Deloitte consulted with the UK's leading secondary glazing specialist, Selectaglaze and the company's local partner, Fenestral.

With a wealth of experience within Listed and historic buildings Selectaglaze and Fenestral were uniquely placed to understand the very special nature of Tate Liverpool's requirements.

Following trials the preferred solution was a pair of white powder painted hinged casements arched to follow the window line. With flush hinges, white gaskets and concealed locking the frames provide minimalist lines.

Tate Liverpool requested special protection against damaging UV light, which was achieved with 6.8mm clear laminated glass together with an additional specialist UV film.

Multipoint locking and high compression seals ensure tight seals and so help maintain temperature and humidity within the gallery. The hinged panels allow easy access for cleaning and maintenance.

After a full assessment by Tate Liverpool staff who supervised the process, the work was undertaken outside gallery opening hours and caused no disruption to the art work on display.

Founded in 1966, Royal Warrant holder Selectaglaze has gained a reputation as a leading secondary glazing specialist offering high performance noise insulation, improved building energy performance, environmental control and certified security.

Fenestral has 20 years' experience in the maintenance and refurbishment of window systems and also offers professional consultancy and a range of specialist window products. Fenestral has partnered Selectaglaze for over 15 years.



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Supreme Court



Benefit: Warmer, Quieter and Safer

Type: Refurbishment

Listing: Grade II*

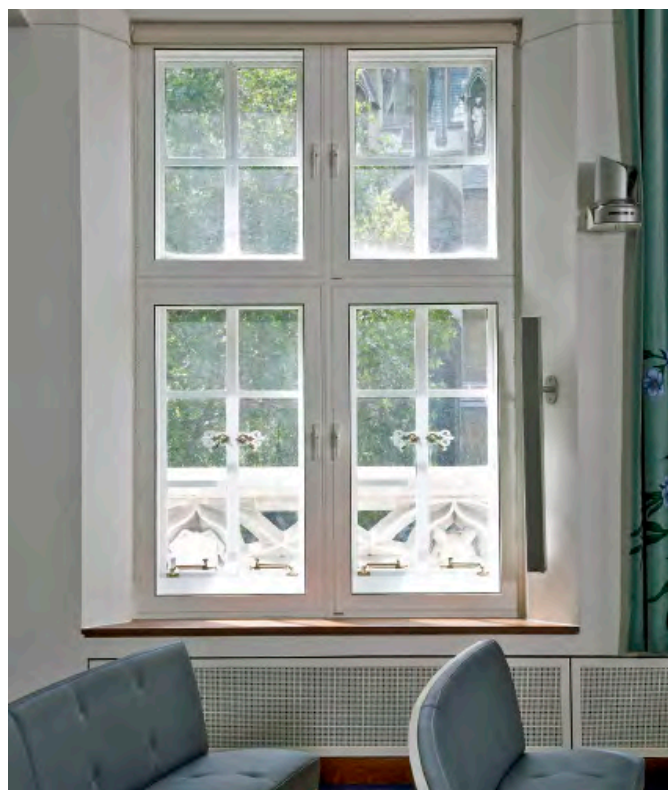
Located on Parliament Square, opposite the Houses of Parliament and close to Westminster Abbey and the Treasury Building, is the UK's first Supreme Court.

Working on behalf of the Ministry of Justice, the design team for the Supreme Court, led by Feilden and Mawson and supported by Foster & Partners, developed refurbishment plans conserving the fabric of the building while creating a modern working environment.

Main contractor Kier Wallis called upon Selectaglaze, the UK's leading secondary glazing specialist, to help improve the building's environmental credentials and security through designs and specifications sympathetic to the complex variety of windows found in this Grade II* Listed building.

One key objective was to achieve BREEAM rating 'Very Good' which required a significant improvement in the thermal efficiency of the windows and reduction

in draughts. The use of a hardcoat low emissivity glass within the secondary window lowers the U-value, a measure of heat loss, to below 2.0.



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Sound insulation was equally important for the proceedings of a Court set so close to one of the busiest parts of London with its constant noise from heavy traffic and crowds of tourists. The Selectaglaze windows glazed with a thick laminated glass can reduce noise levels by more than 45dB and will also markedly improve the security of this sensitive building.

The project required 450 separate window frames ranging from hinged casement, vertical sash, fixed and horizontal sliding to sympathetically treat the very wide range of window styles. This included a significant number of gothic arches and three large shaped acoustic screens between the public gallery and Courtroom 3.

Founded in 1966, and Royal Warrant holders since 2004, Selectaglaze has a wealth of experience working in buildings of all styles, including Listed properties.

A wide range of extensively tested products and fully bespoke manufacture allows sympathetic designs to be created for all types of window.

Literature and guidance notes covering acoustics, thermal performance and added security are offered together with a technical advisory service and a RIBA approved CPD Seminar.





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Banqueting House



Benefit: Security

Type: Refurbishment

Listing: Grade I

The Banqueting House, Whitehall lies at the heart of the tourist trail with Buckingham Palace, Westminster Abbey, Downing Street and Trafalgar Square all a short walk away.

Banqueting House is managed and cared for by Historic Royal Palaces, the independent charity that also cares for the Tower of London, Hampton Court Palace, Kensington State Apartments, Kew Palace and Hillsborough Castle.

Inigo Jones designed the current Banqueting House in 1619-22 after its predecessor was destroyed by fire. Since its construction, Banqueting House has stood witness to many historical events; its primary use was to stage State events, masques, provide private drinking space for James I and in 1636 to display the great ceiling paintings of James I by Sir Peter Paul Rubens.

Famously, King Charles I was executed, in Cromwell's time, outside the building in 1649 on a temporary scaffold specially built for the occasion.



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Banqueting House is also the only complete surviving building left of Whitehall Palace, which burnt down in 1698.

The security window installations were part of the first phase of works to repair and restore this stunning Grade I Listed building. Security was a key concern when planning the works, as was reducing the noise breakthrough from the busy Whitehall thoroughfare.

The design replaced the blast net curtains and allows daylight once again to flood into the Main Hall, as well as providing a significant level of noise insulation to ensure visitors peace and tranquillity when viewing the Rubens. Royal Warrant Holders, Selectaglaze, was approached to provide a fitting bespoke solution that not only offered protection to the large windows, but was a discreet and unobtrusive window treatment, to blend in with the historic Inigo Jones designed interior.

Selectaglaze knew it had products certified to the requirement, but they had never been specified to these sizes. The Main Hall window openings were 3.6m high and 2.0m wide. Two years ago, testing was carried out for what turned out to be the largest ever single casement to be blast tested in the UK. The results were a success and planning for the installation began.

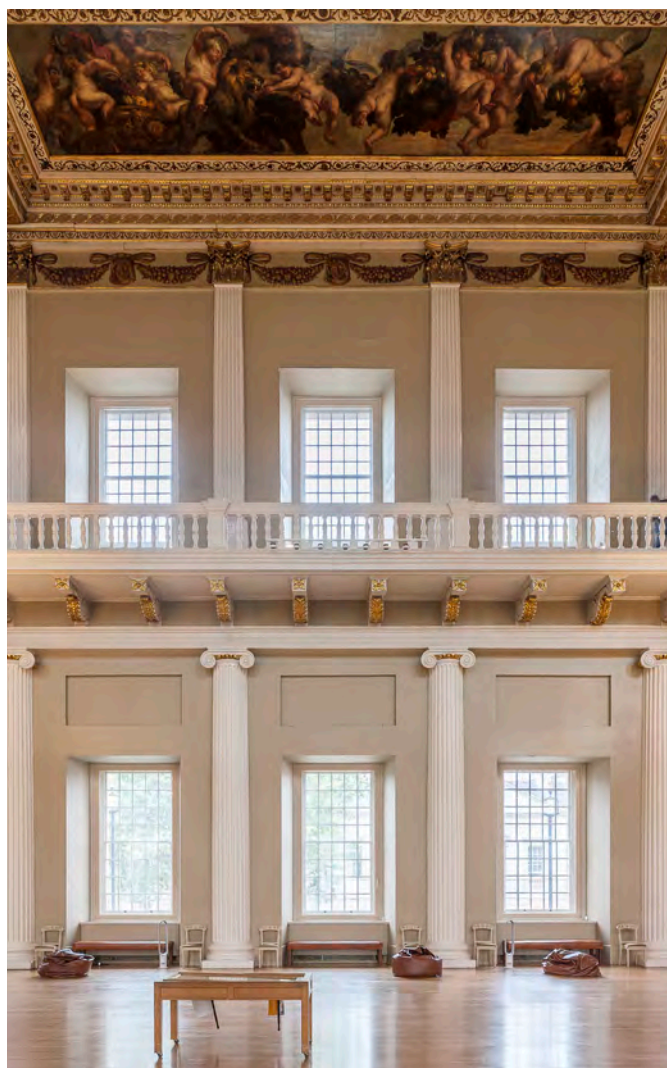
Installing the units provided an interesting challenge as half the openings were at upper gallery level 10m above the main floor. The gallery could not be loaded. Working very closely with Gardner & Theobald, structural engineers Hockley & Dawson and Royal Warrant holding scaffolders Allen and Foxworthy, a careful method of installation was devised involving a columnar scaffolding design complete with lifting apparatus to each opening. In all, 39 units were installed.

"The windows look great, I bet you never thought you would hear me say that!" commented the architect. As well as offering blast protection and noise insulation in excess of 45dB, the secondary glazing also provides

essential UV filtering to the Thomson Specification approved by the National Gallery, V&A and others.

Secondary glazing is fitted to the room side of a building and is a completely independent and fully reversible adaptation, widely accepted by most heritage bodies.

Selectaglaze is the specialist in the design, manufacture and installation of secondary glazing. With fifty years' experience, it has worked on all building types, from new build hotels, to Listed museums.



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Secondary Glazing

Birmingham Town Hall



Benefit: Quieter

Type: Refurbishment

Listing: Grade I

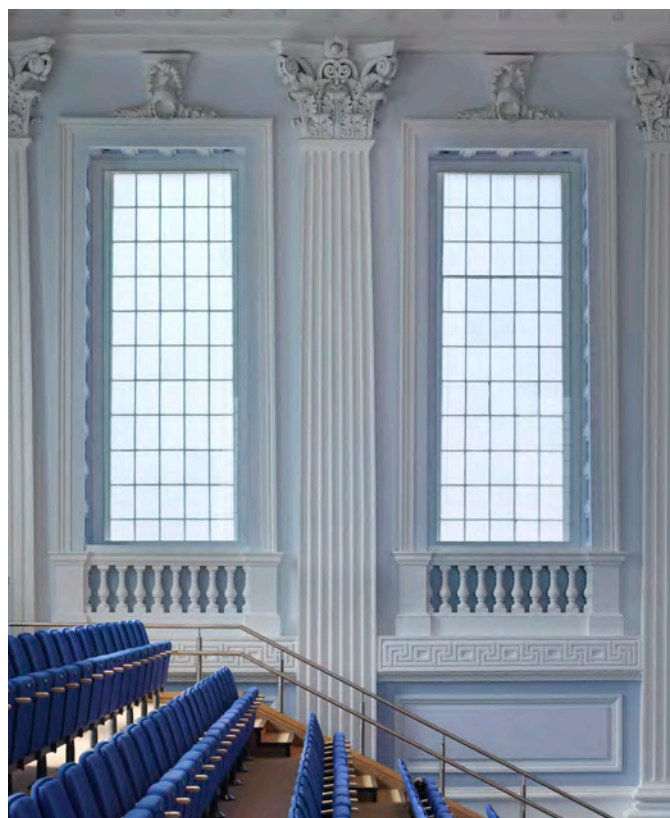
At the noisy heart of bustling Birmingham is the city's Town Hall, an impressive example of Roman Revival civic architecture. Designed by Joseph Hansom (of "Hansom Cab" fame), this Grade I Listed landmark building is based on the Roman Temple of Castor and Pollux.

With a refurbishment budget of £34m, the 1830s iconic masterpiece will once more become the performance centre of the city. However, the journey from faded glory to world class concert venue was hardly straightforward and took the combined expertise and ingenuity of main contractor, Wates Construction and Selectaglaze, the country's leading secondary glazing specialist.

The challenge was to prevent the sounds of the city from interfering with the most sensitive of arias while maintaining clean sight lines for the building's original windows and Listed façade.

The solution was a monumental story in the real sense of the word. Working with their tried and tested Series

50 side hung casement, Selectaglaze produced a unit which, at 4.5m high, was substantially taller than any previous construction.



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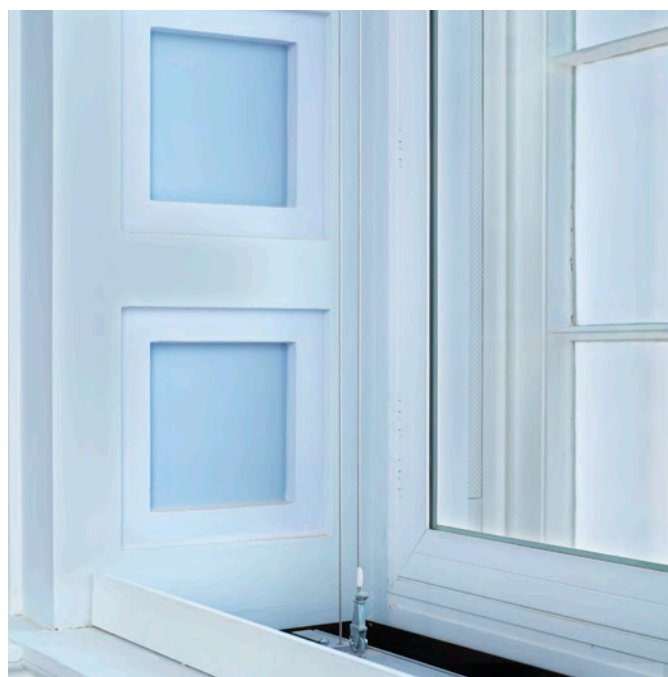
And at 1.8m wide, the complete casement weighed in at over 200kg. Having met this first challenge, the next was how to fit the largest casement ever made, 8m up from floor level to cill!

Working closely with Wates Construction, an ingenious combination of rollers, vacuum lifting gear and purpose designed scaffolding was identified as being the most practical way of positioning the windows so that they could be presented to the specially reinforced openings.

And, of course, the acoustic performance of the glazing combination and the fitting procedure had to be tested on the initial prototype before the main task of manufacture and installation could be undertaken.

Other necessary changes to the original Series 50 unit included the modification of the locking mechanism so that the unit could be closed by a single handle operated near the base of the window.

The benefits of secondary glazing systems are not only in sound insulation. The range also offers high levels of thermal insulation and can be specified to incorporate Part L compliant sealed units. The company also offers a suite of security windows providing certified



protection against blast, physical and ballistic attack and fire retardant rating.

Secondary glazing systems are purpose made and arrive fully assembled to allow rapid installation with minimal disruption. They need very little maintenance and will continuously contribute to energy savings.





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Holburne Museum



Benefit: Warmer and Quieter

Type: Refurbishment

Listing: Grade I

Sir William Holburne (1793–1874) was just eleven when, as a midshipman, he took part in the Battle of Trafalgar. It is thought as an antidote to the horrors of his early life at sea, William dedicated his adult life to collecting objects of beauty, which were eventually gifted to the city of Bath.

In 1916 the ornate Grade I Listed eighteenth century Sydney House Hotel was purchased to accommodate William's collection and become The Holburne Museum.

The building underwent a £11.2m renovation and extension - including architect Eric Parry's three-storey glass and ceramic extension designed to provide intimate state-of-the-art galleries and visitor café.

The main original part of the building now houses two magnificent galleries, including what was once the Hotel's ballroom, now known as 'The Ballroom Gallery', whose central displays include silverware, porcelain and china collections; bronze statuettes and oil

paintings hanging alongside the room's monumental windows and floor-to-ceiling balcony doors. With windows to three sides, The Ballroom Gallery is light and airy, capturing the sun throughout the day, presenting perfect viewing conditions but is potentially detrimental to the sustainability of the room's exhibits.



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To help alleviate this hazard and to provide much needed added security, main contractor Sir Robert McAlpine consulted with the UK's leading secondary glazing specialist, Selectaglaze. With a wealth of experience within Listed and historic buildings Selectaglaze was uniquely placed to understand the very special nature of The Holburne's requirements.

In order to protect the exhibits from the harmful rays of the sun, Selectaglaze proposed a single hinged casement to each window incorporating Anti-UV glazing. And to provide an acceptable level of security the windows incorporated a multi-point locking system accredited to 'Secured by Design'.

Other design considerations included a paint finish to match the surrounding décor and maintenance of clean lines through the use of flush hinges and a flush lock. The finished result is secondary glazing which blends imperceptibly with the Ballroom's monumental sash windows with no additional sight lines to mar the spectacular views of this stunning Georgian city.



Selectaglaze is the leading specialist in secondary glazing, established in 1966 and Royal Warrant holders since 2004. It boasts a wealth of knowledge and a range of extensive products to suit all projects from Listed properties, to new builds. The Company offers a wide range of tested products. A free technical advisory service is offered and a RIBA approved CPD is available to architects and designers.



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Enfield Library



Benefit: Warmer and Quieter

Type: Refurbishment

The company's challenge at Enfield Town's Library was to help bring the original 1912 building up to today's demanding standards of thermal and noise insulation while maintaining the Listed character of its Edwardian façade.

Windows are an important architectural element of many traditional libraries but being single glazed they provide minimal thermal insulation and poor acoustics.

Due to technological and design advances in recent years, secondary glazing now provides an attractive and practical solution to these issues, particularly for Listed buildings.

A secondary window is a reversible adaptation and with sensitive design, it can provide a sympathetic addition to any building. This will offer far more significant noise insulation than standard double glazed units and the use of thermally efficient glass will reduce heat loss by more than half.

Security of collections is also becoming more important and secondary glazing, accredited to Secured by Design or to Loss Prevention standards, will provide a significant but discrete barrier.



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To achieve this, Selectaglaze treated a total of 27 sash windows with a combination of vertical sliding counter-balanced units and lift-out units, thus enhancing the building's green credentials and at the same time keeping the noise of the town traffic at bay.

Established since 1966 and a Royal Warrant Holder since 2004, Selectaglaze is at the forefront of product development and design.

The extensive range of systems has undergone rigorous third party assessment and tests covering acoustics, thermal efficiency, and resistance to intruder or blast.



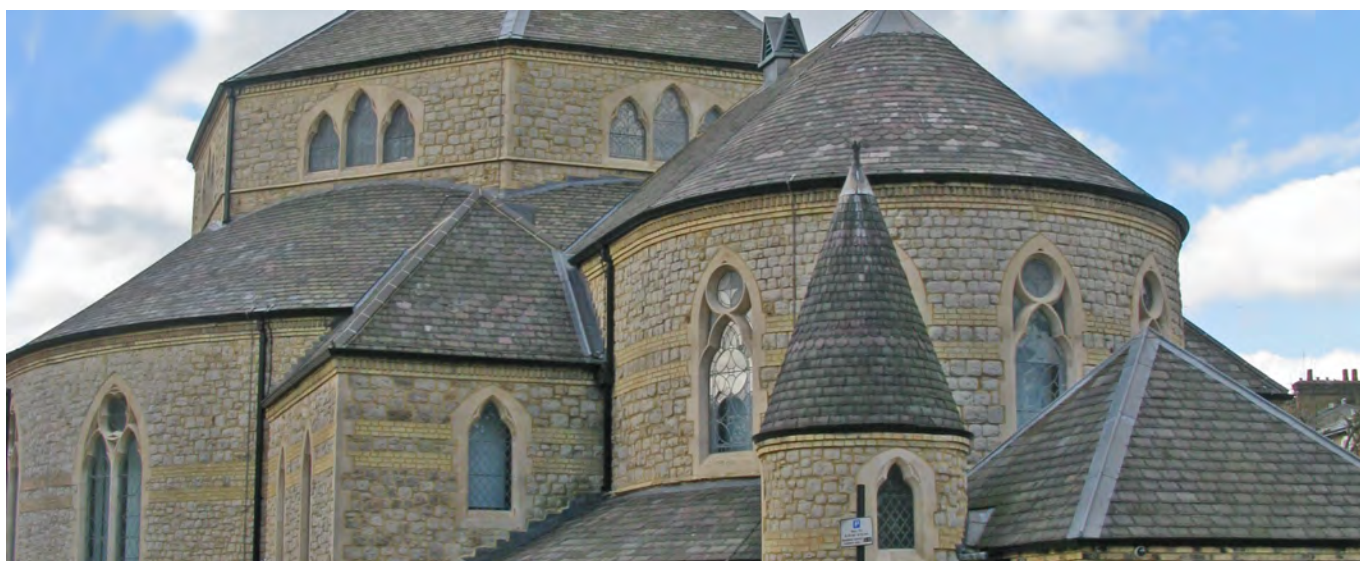


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St George's Church, Tufnell Park



Benefit: Quieter and Safer

Type: Refurbishment

Listing: Grade II

Based on a medieval church in Salonica, St. George's in London's Tufnell Park dates back to 1861. Like many places of worship, St. George's has had an interesting and varied career, including a spell as a Shakespearean Theatre. More recently the building was purchased by the Protestant evangelical church organisation, 'House On The Rock'. Now renovated and renamed 'The Rock Tower', the building provides a multi-functional centre for the local congregation and wider community.

In addition to its function as a place of worship, 'The Rock Tower' is regularly used for live music events and theatrical productions. So a major consideration during renovation works was acoustic insulation for noise containment.

Working closely with Architects Paul Davis and Partners and Main Contractor Kier Wallis, Selectaglade; the UK's leading designer and manufacturer of secondary glazing systems, was called upon to resolve the problem

of noise break-out via the windows, the majority of which were gothic arched headed stone mullion with stained glass.



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The windows to the nave, measuring 4.5m high x 2m wide, some being 11m from floor level, required a composite arrangement of shaped units for the heads with either side hung casements or vertical sliding units below for ease of access and maintenance.

As part of the refurbishment process, a mezzanine floor was added to provide a seating balcony; this dissected several of the windows required to be fitted with secondary glazing. Selectaglaze treated a total of 60 windows, many utilising their Series 40, 41 and 45 side hung casements, all produced with 6.4mm laminated safety glass.



Selectaglaze has undertaken a number of projects involving church refurbishment or change of use, including the Grade II* Listed St. John the Evangelist Church, Hammersmith which, having been decommissioned by the Church of England, was taken over by the famous Godolphin and Latymer School and is now a state-of-the-art performance centre.



Purpose designed secondary glazing can be unobtrusive, sympathetic to the building and, in addition to noise insulation, markedly improves the window's thermal efficiency and increases levels of security. Full factory assembly allows rapid installation with minimal disruption to the building and its occupants.

