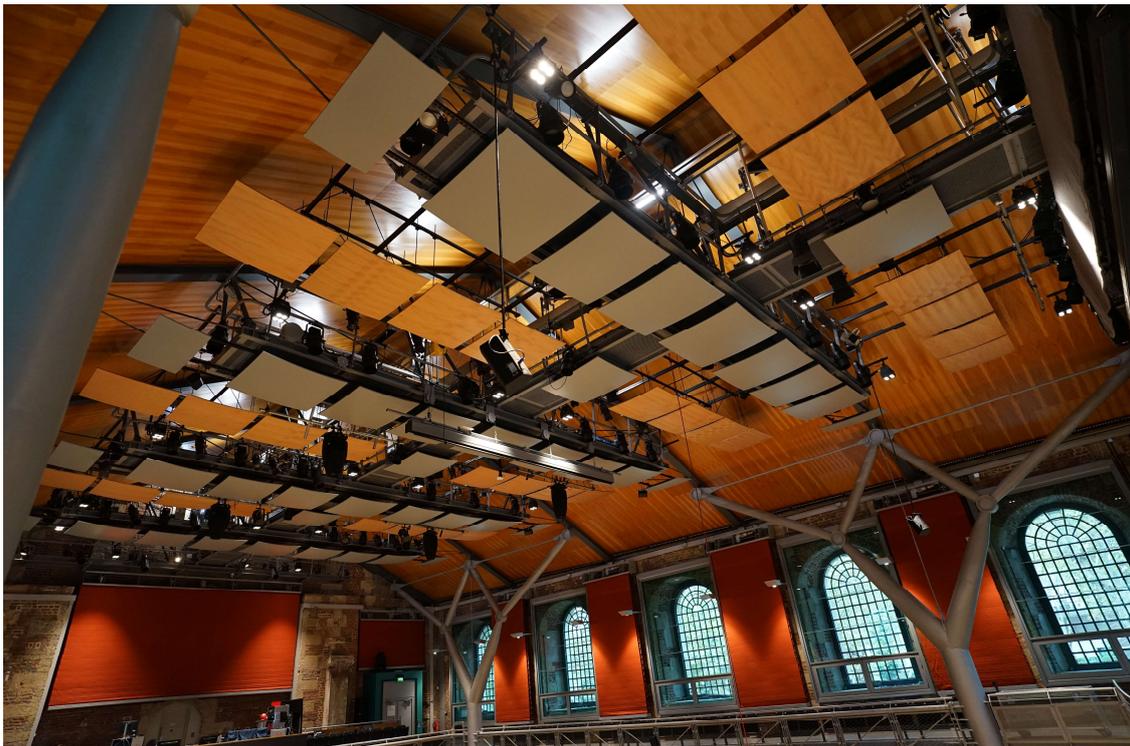




Future Ready – London Symphony Orchestra - St. Luke’s

Precision Stage Engineering for an Acoustic Renaissance



Internal View of Jerwood Hall Facing Northwest

Client:	London Symphony Orchestra
Architects:	Levitt Bernstein Associates Limited
Acoustician:	Threshold Acoustics LLC
Theatre Consultant:	John Riddell of Theatre Projects
Project Structural Engineering:	Price & Myers LLP
Principle Construction Contractor:	GPF Lewis PLC
Stage Engineering:	EEE Build Ltd.
Structural Engineers to EEE Build Ltd.	Alan White Design Ltd.
Draughting Support to EEE build Ltd.	Sygma Cad Ltd.
Acoustic Reflectors Fabrication	Realm Projects Ltd.
Project Duration Onsite:	January – October 2025
Team Size:	6-10
Completion:	15 th October 2025

Re-Engineering a Home for the Orchestra

For over twenty years, LSO St Luke's has been a home for the London Symphony Orchestra — a place for rehearsals, recordings, performances, and for *LSO Discovery*, the Orchestra's pioneering education and community programme.

Originally designed by Nicholas Hawksmoor and completed in 1733, the Grade I listed church was rescued from dereliction and reborn as a music centre in 2003. Two decades of constant use, however, had taken their toll. The time had come for renewal.

The *Future Ready* project — an £8 million transformation led by Levitt Bernstein Associates with GPF Lewis, Theatre Projects, Threshold Acoustics, and Price & Myers — set out to preserve the building's heritage while preparing it for another generation of artists, audiences, and students.



LSO St. Luke's Exterior View © David Levene



Refurbished Basement Café © David Levene

The refurbishment was both comprehensive and sensitive. Jerwood Hall, the building's acoustic heart, was re-engineered to provide greater flexibility and control. New timber reflectors and refurbished acoustic banners now give the Orchestra a refined, adjustable sound environment.

Beneath the hall, the basement was fully reconfigured to house new Discovery Rooms, purpose-built for education and outreach. Improved circulation, lighting, and accessibility

have turned the lower level into a bright, welcoming space supporting the LSO's growing community work.

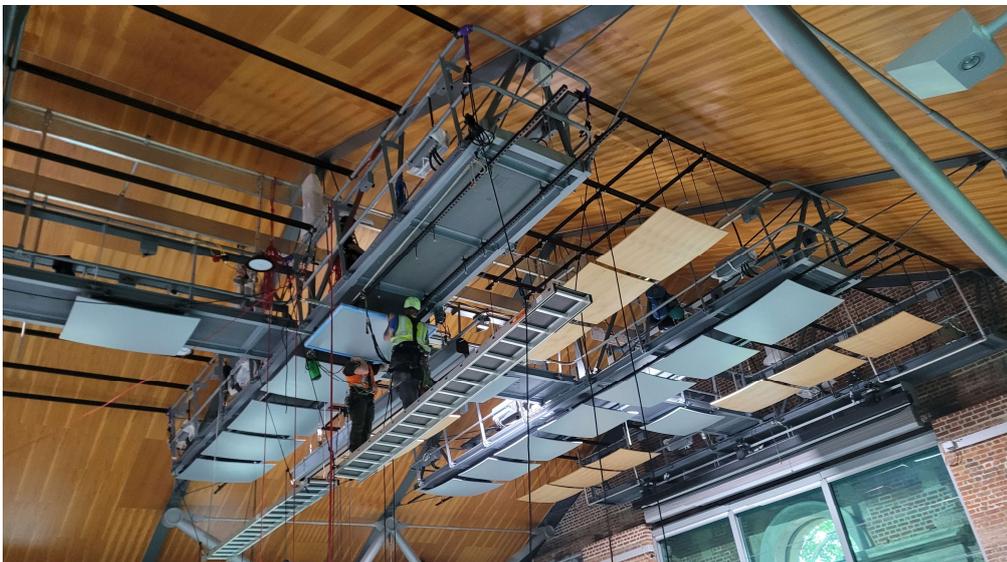
Across the site, technical and digital infrastructure was brought firmly into the 21st century. A new audio control room and master control suite now link every performance space, while energy-efficient mechanical and electrical systems, upgraded ventilation, and LED lighting reduce energy use and enhance comfort.

Even the churchyard was renewed — landscaped, re-lit, and made accessible to all — restoring a tranquil green space in the heart of Islington.

The result is not merely a refurbishment, but a re-composition: a historic building tuned anew for modern performance, digital production, and public engagement — ready, once again, to serve as the Orchestra's home and heartbeat.



Interior View of South Wall – Jerwood Hall, Showing Acoustic reflectors in the roof, Retracted Acoustic banners to the wall and a moody blue lighting with large windows as a focus to the image. © David Levene



Works Underway Transforming the Lighting Bridges with Acoustic Reflectors

Our Role – EEE Build’s Scope of Works

EEE Build Ltd was first contacted in August 2024 as the incumbent contractor invited to quote for the stage engineering package at LSO St Luke’s. Having worked extensively within the venue for more than two decades, the team already knew the site and its systems intimately. Twenty years earlier, Triple E had designed and installed the original variable acoustic system: twenty-two wall-mounted and ten ceiling-mounted banners controlled by a touchscreen interface. That system had performed reliably for two decades — testament to its design and installation quality — and the wall-mounted elements remained untouched as part of this new refurbishment. The ten ceiling-mounted banners, however, now formed part of the upgrade.



EEE Build’s Technical Director, Rowan Bean-Coupe

Following review of the tender specifications issued by Theatre Projects, EEE Build’s Director, Rowan Bean-Coupe, handled the enquiry directly, scrutinising the documentation and developing a detailed quotation based on the available information. Two distinct work packages were identified: the refurbishment and relocation of the acoustic banners, and the design and installation of the new acoustic reflector system.

The Acoustic Reflectors

The centrepiece of EEE Build’s involvement was the installation of seventy-two acoustic reflectors in Jerwood Hall. The brief called for a precision-engineered suspension system



Looking West at LSO’s Jerwood Hall

capable of safely supporting each reflector while allowing exact positioning to achieve the intended acoustic performance.

Working in collaboration with Theatre Projects, Realm Projects, Alan White Design, and the wider project team, EEE Build designed a bespoke Unistrut matrix, developing



A harnessed worker preparing to begin works.

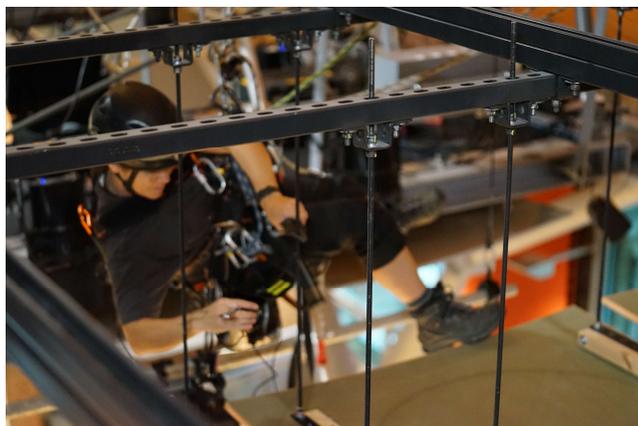
3D models and detailed installation drawings for review and coordination. Once approved, the system underwent rigorous in-house load testing to confirm its strength, safety factor, and compliance with design loads before any works commenced on site.

With design sign-off achieved, sample installations were completed in situ to verify appearance, alignment, and methodology. One veneered and one painted panel were installed for client and consultant approval before full production began.

The original access plan scheduled the use of MEWPs and scaffold towers for the final phase of the program, leaving a narrow installation window with little contingency before handover. As the overall schedule tightened, GPF Lewis sought to accelerate the works, creating time for review and commissioning ahead of

completion. With the ground floor of Jerwood Hall already occupied by welfare facilities, offices, and circulation routes, traditional access equipment was no longer practical. GPF Lewis led the exploration of IRATA-qualified and worked under strict control measures including daily briefings, DROPS registers, and tool-lanyard discipline, ensuring safe and efficient progress throughout the operation.

From this position of control and safety, the team installed the full Unistrut suspension system and proceeded to hoist and position each of the seventy-two reflectors. With limited storage on site, panels were cross hauled from the north balcony and installed sequentially, each set and locked to precise measurements and acoustic angles. Final verification included torque checks, paint-pen witness marking, labelling, and sign-off against drawings.



Mid-Work in Suspension at LSO

Accuracy was such that the final acoustic tuning session planned by Threshold Acoustics was largely unnecessary — the system required only minor adjustment before being declared complete.



The Acoustic Banner Refurbishment

The second major element of EEE Build’s scope was the refurbishment and re-installation of the ten ceiling-mounted acoustic roller banners within Jerwood Hall. Originally provided by Triple E twenty years earlier, the banners had performed reliably but were now due for renewal and relocation. Under the new acoustic strategy, the banners were to be moved from their previous position along the exterior edges of the hall — mounted directly to the lighting bridge handrails — to new positions one meter either side of the centerline, mounted high within the roof space from the handrails. The number of banners would also reduce from ten to five. This relocation brought the banners into closer alignment with the new acoustic reflector array, improving control and cohesion across the performance area.

This required the complete removal of all banner assemblies and associated damping components for off-site refurbishment at EEE Build’s workshop. Each unit was carefully



Refurbished Acoustic Roller Banner



Fully Retracted Refurbished Acoustic Roller Banner

dismantled, packaged, and returned to the workshop for refurbishment.

Because of the new configuration and reduced number of banners, fresh installation designs were required, including new support infrastructure. In keeping with the project's sustainability objectives, EEE Build adopted a re-use and recycle approach wherever possible. All existing aluminium scaffolding tubes and clamps were retained, cleaned, and powder-

coated for reuse, with only minimal new hardware introduced where necessary.

EEE Build carried out the full design coordination and structural verification for the relocated systems. As the original designers of the Triple E roller banner mechanism, the team were able to refurbish the mechanical assemblies entirely in-house, replacing consumables and re-commissioning every unit to its original specification. New black Kilo wool acoustic drapes replaced the previous grey versions, improving visual integration with the refurbished hall. The existing Stage Right touchscreen control panel was retained and the banners seamlessly reintegrated, maintaining continuity with the building's established control architecture.

Installation of the five reconfigured banner assemblies was completed using the same high-safety protocols developed for the reflector works — a combination of rope-access methods, netted protection zones, and strict tool-control procedures. One of the principal challenges was positioning the roller housings as close to the roof structure as possible without overhead lifting equipment. The team overcame this using precise manual-handling techniques and custom rigging aids, achieving millimetric alignment across all units.



Fully Deployed Refurbished Acoustic Roller Banners

Balcony Unistrut Support System

As the refurbishment progressed, GPF Lewis sought to improve the production rigging options beneath the balcony of Jerwood Hall. The existing provision — a single rated scaffold bar running along the balcony edge — limited flexibility and load capacity. A more capable and integrated solution was required.

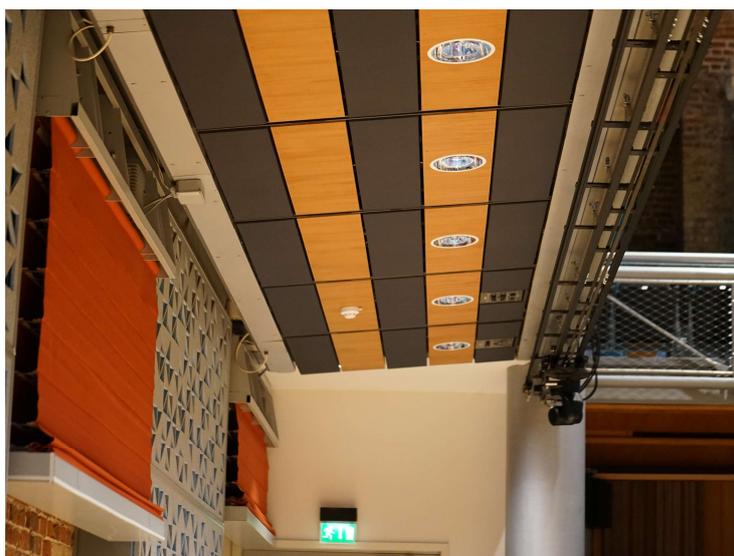


Unistrut Between Acoustic Treatment

EEE Build was commissioned to design, engineer, fabricate, and install a new system: a concealed Unistrut array running the full underside of the balcony, hidden neatly within the acoustic and timber panelling. This would provide a uniform series of rigging points, each discreetly load-rated for future technical and production use.

Working from the architect's and acoustician's intent, EEE Build developed bespoke installation bracketry to span between the existing timber joists, ensuring minimal visual impact while achieving full load compliance. Every fixing detail was considered in coordination with surrounding trades — joinery, acoustic panel installation, and electrical containment — to achieve a seamless integration.

The entire system was structurally engineered by Alan White Design and sample-tested offsite at EEE Build's facility, including load and pull testing to verify the performance of



Under-Balcony Unistrut Support System

both bracket and substrate. Black powder-coated P1001T Unistrut was selected to match the aesthetic of the surrounding finishes, and all components were supplied, installed, load-tested, and certified by EEE Build. Discreet identification labels were fixed internally within the Unistrut channels for traceability.

The completed installation now provides a 0.5 kN

uniform load rating per section, creating a versatile and concealed rigging infrastructure beneath the balcony. The system significantly improves technical capability within Jerwood Hall while maintaining the clean architectural finish of the space. Delivered alongside other concurrent work packages, it demonstrated EEE Build's ability to design and implement complex, high-precision engineering within a live, heritage-sensitive environment.

Basement Unistrut Matrix

During the latter stages of the project, while completing the main installation works, GPF Lewis identified a significant challenge in suspending the new circulation ceiling for the basement cafeteria and adjoining corridor areas. The existing concrete soffit was heavily congested with services — ductwork, pipework, and extensive cable tray — leaving no consistent fixing points from which to support the ceiling grid.



Incumbent Congested M&E Matrix

From this, a secondary Unistrut matrix was suspended to create an even, measurable ceiling support grid.

The constraints were considerable. The slab was already partially obscured by legacy Unistrut and cable networks, making physical access difficult. Every fixing required careful planning, bespoke spacing, and full documentation. With active liaison between site teams and EEE Build's structural engineers, the design evolved dynamically to accommodate unforeseen conditions without delay.



Bespoke LOLER Compliant Labelling

EEE Build was engaged to develop a solution. Our task was to translate this complex and irregular layout into a structurally coherent suspension system that would provide uniform support across the entire area. Working closely with GPF Lewis and with input from Alan White Design, our engineers designed a primary Unistrut framework to span between available fixing points, spreading the

Height control was critical: tolerances were measured in millimetres, and any deflection risked misalignment across the entire ceiling. Deflection under load therefore became the governing design parameter, with each span checked and verified during installation.



Concealed Success – The completed Circulation Ceiling

Despite the complexity, the system was delivered precisely to design and fully integrated with the surrounding M&E services. The resulting structure — invisible once completed — represents the kind of detailed, adaptive engineering that underpins the success of projects like this. It also reflected the growing trust GPF Lewis placed in EEE Build’s capability to take on additional work packages and deliver them with the same care and precision as the principal scope.

Cafeteria Unistrut Installation

During the ceiling installation phase, the circulation ceiling contractors encountered a problem around the cafeteria ventilation system, where additional structural support was required for a long span. EEE Build, maintaining suitable spares on site for contingencies, were able to respond immediately. Two 6 m lengths of P1001T double-backed slotted

Unistrut were supplied and installed, simply supported in 4 m spans to meet the ceiling contractor’s requirements.



Cafeteria Ducting Unistrut Installation - Hidden

The issue was identified late one evening and resolved before lunch the following day — demonstrating EEE Build’s capacity to provide rapid, technically verified solutions. Quick load-table checks, and overnight reporting ensured compliance, while prudent stock management allowed the work to proceed without delay.

Roof Access & Safety Works

Early in the programme, in February 2025, EEE Build was commissioned to review, inspect, and formalise the roof access arrangements at LSO St Luke's. The building's only access to the main roof catwalk system was via an 18th-century spiral staircase, offering no secondary means of escape.

Working with GPF Lewis and the site management team, EEE Build developed a comprehensive Roof Access and Egress Safety Plan to ensure both compliance and practical safety



Access To the Roof Catwalks

for contractors. The works began with the removal and off-site thorough examination of the existing Tractel Derope emergency descent devices, which were out of inspection at the time. The units were delivered to an authorised Tractel inspection agent, tested and re-certified, then reinstalled and signed off by EEE Build.

To support safe use of the roof and catwalk systems, EEE Build produced detailed Access and Rescue documentation and delivered onsite training to GPF Lewis contractors. Two rope-access instructors led practical sessions covering the wearing and inspection of harnesses, controlled emergency descent using the Tractel system, safe live descent practice with a secondary safety line, and rescue and communication protocols.

In addition, managerial staff were briefed on emergency coordination, incident response, and decision-making during a roof evacuation scenario. All participants completed a knowledge test and practical assessment, ensuring competency before access was granted.

This proactive package established a safe working method for roof operations, provided a compliant second means of escape, and set a standardised procedure for all future maintenance and inspection work at height within the venue.



Tractel De-Rope



The Roof Catwalks

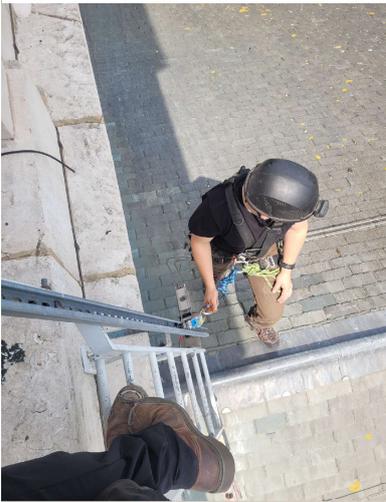


Pull Testing PPE Eyebolts at LSO

Additional Works and Handover

Alongside the principal scope, EEE Build completed several supporting work packages that contributed to the overall delivery of the LSO St Luke’s project.

During GPF Lewis’s tenancy, EEE Build carried out a LOLER, PUWER, Work at Height, and PPE inspection of the building’s exterior roof safety systems, including all lifelines and eyebolts. This ensured full compliance and certification on behalf of the end client prior to handover.



Roof Latchway and Lifeline Safety Examination

The team also provided rope-access support to the electrical contractors, assisting with the opening of containment covers, and cable routing in areas where access was otherwise impractical.

In addition, EEE Build supplied colour-matched fascia plates for the brick down-lights on a supply-only basis, manufactured to integrate seamlessly with the surrounding finishes.



Supply Only: Color Matched Fascia Plates for Lighting.

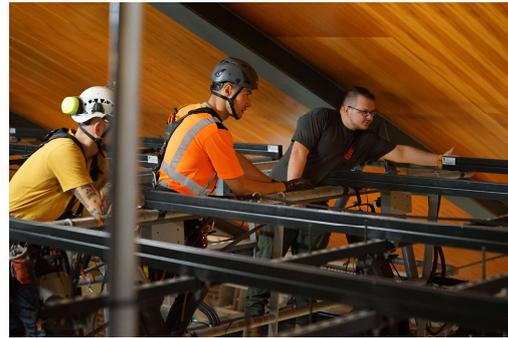
To conclude the project, EEE Build compiled and delivered comprehensive Operation and Maintenance documentation covering all work packages — including as-built drawings, test and inspection records, structural verification reports, and product data, — ensuring full traceability and long-term maintainability of the systems installed.



Examples of Wide Range of Labelling Produced

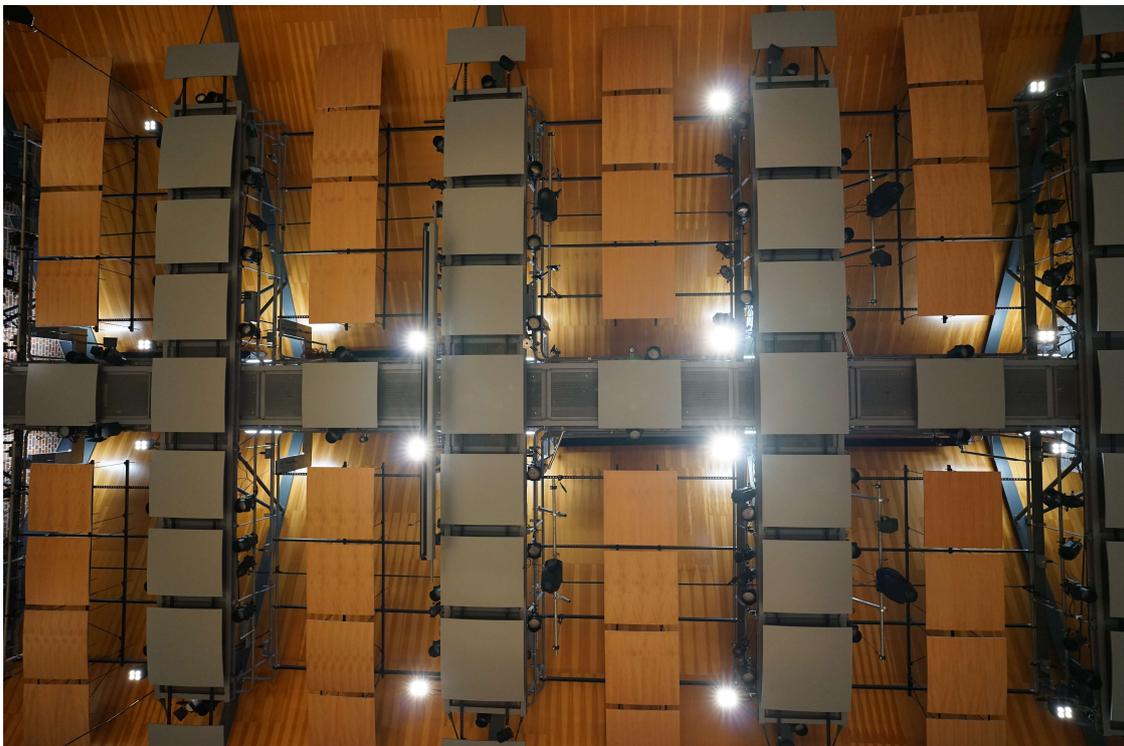
Collaboration

The success of the LSO St Luke's *Future Ready* project relied on close, consistent collaboration between all parties involved. EEE Build worked in daily coordination with GPF Lewis as Principal Contractor and had regular contact with all stakeholders. GPF integrated this using "Procore" software to allow the wide range of consultants to comment on technical submissions. This ensured the precise execution of complex stage-engineering works within a live and heritage-sensitive site.



A Team Driven Approach

Early planning sessions brought together Levitt Bernstein Associates Limited, Threshold Acoustics LLC, Realm Projects Ltd, Price & Myers LLP, and EEE Build Ltd. All under Klára Svoboda's management (Senior Design Manager - GPF Lewis PLC) to align the acoustic design intent with the structural and architectural constraints of Jerwood Hall. Through detailed modelling, clash coordination, and structural verification, the team ensured that every fixing, bracket, and reflector position met the required tolerances and acoustic geometry.

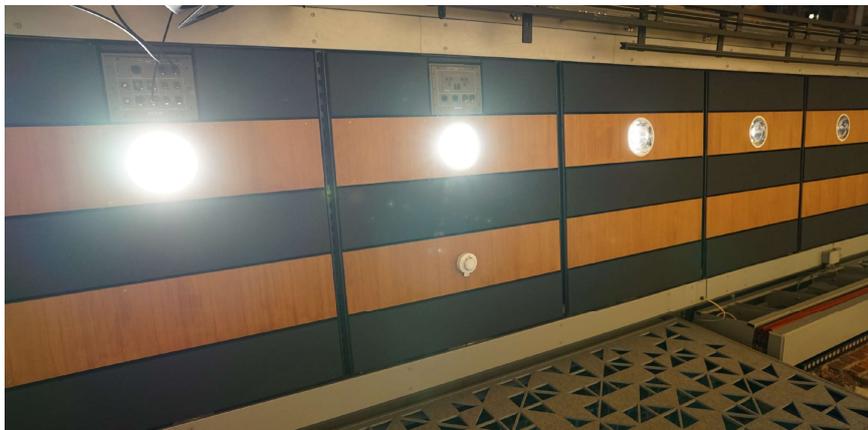


A View Square on to The Panels

Technical Highlights

- Acoustic Precision: 72 timber acoustic reflectors installed to millimetric tolerance, each individually levelled and angle-set.
- Banner Re-engineering: Five ceiling-mounted acoustic roller banners refurbished, re-located 1 m from the centerline, and fully reintegrated with the existing control system.
- Structural Integration: Bespoke Unistrut suspension systems designed and installed in Jerwood Hall, balcony voids, and basement areas.
- Adaptive Access: Full rope-access methodology developed and approved, replacing MEWPs and scaffolds to maintain program continuity.
- Safety & Compliance: Roof-access safety systems, Tractel Derope inspections, and emergency-descent training delivered to site personnel.
- Verification: All systems load-tested, torque-checked, labelled, and documented within comprehensive O&M manuals.

Acoustic Panel Project	Qty
Panels	72 off
Fastener sets:	2260 off
Unistrut	288 m
Slotted Angle	144 m
M10 Threaded Bar	576 m
On-site work hours	In excess of 1200
Roller Banner Refurbishment Project	Qty
Fastener sets:	240 off
Scaffold	100 m
On-site work hours	In excess of 144
All other works	Qty
Fastener sets:	816 off
Unistrut	254 m
M10 Threaded Bar	86 m
On-site work hours	In excess of 220



Under-Balcony Unistrut Support System

Project Challenges & Solutions

The LSO St Luke's *Future Ready* project presented an unusually complex set of technical and logistical challenges, shaped by the constraints of a Grade I listed building, and a tight delivery programme.

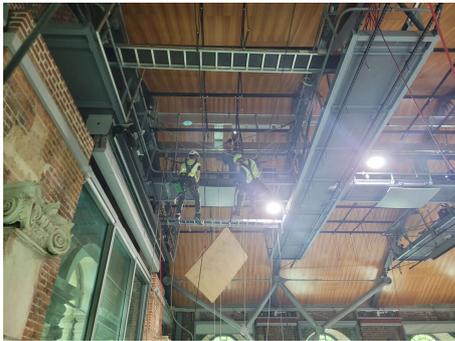


Rope Access Presented Some Considerable Challenges

Access and Programme Constraints

Jerwood Hall's ground floor was fully occupied by site offices and welfare facilities for much of the build, leaving no clear area for conventional access

equipment. The original plan to use MEWPs and scaffold towers at the end of the programme offered little contingency. In collaboration with GPF Lewis, EEEE Build re-engineered the methodology to utilise rope-access techniques, allowing reflector and banner works to proceed safely above live site infrastructure and protecting programme continuity.



Hauling Panels

Tolerance and Integration

Across multiple areas — particularly the acoustic reflectors and basement ceiling matrix — installation tolerances were measured in millimetres. Pre-fabrication, accurate surveying, and constant liaison with other trades ensured that all systems aligned precisely with the architectural and acoustic requirements.

Coordination within a Heritage Environment

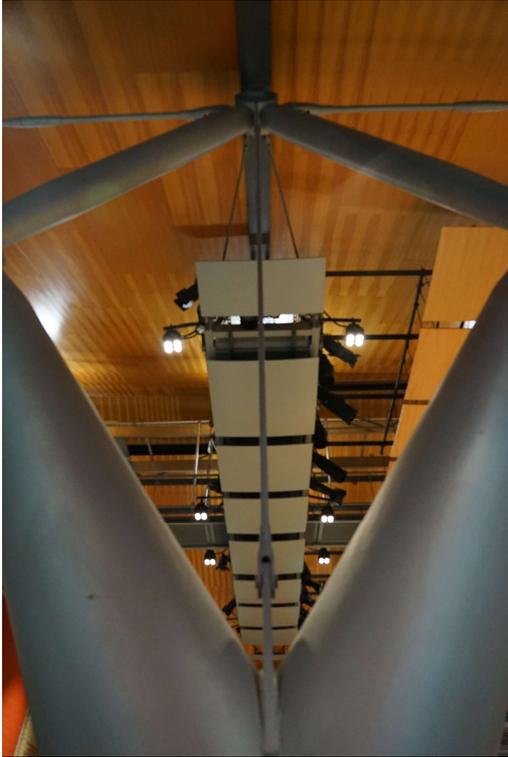
Every intervention was undertaken within the restrictions of a Grade I listed structure, often working around original timber or masonry. Bespoke fixings, reversible bracketry, and concealed load paths were developed to meet both engineering and conservation needs.

Concurrent Work Packages and Expanding Scope

As the project evolved, EEE Build took on several additional packages — from roof-access safety systems to basement support structures — while maintaining resources on the main reflector installation. Careful scheduling, transparent communication, and a flexible



LSO St. Lukes Jerwood Hall



View of Panels Through Roof Support

EE Build's part in that process brought together careful engineering, practical experience, and respect for the constraints of a Grade I listed building. From the design and installation of the new acoustic reflector suspension system to the refurbishment of the roller banners and the construction of concealed Unistrut frameworks, every element was delivered with accuracy and consistency.

The works demonstrate EEE Build's ability to operate confidently within complex, heritage-sensitive environments — balancing the requirements of architecture, acoustics, and construction while maintaining safe, efficient working practice.

Through this project, LSO St Luke's has regained a fully capable and adaptable performance space, equipped to meet the needs of the orchestra, visiting artists, and engineers for years to come.

workforce enabled the company to absorb these tasks without affecting critical path activities.

Verification and Handover

The final phase demanded extensive testing, inspection, and documentation across multiple systems. By conducting in-house load tests, site sample installations, and maintaining continuous engineering oversight, EEE Build ensured that every component was verified, certified, and ready for handover without delay.

Conclusion

The completion of the LSO St Luke's *Future Ready* programme marks an important milestone for the building and for everyone involved in its renewal. It represents not just a restoration of structure, but a return to full acoustic and functional capability.



Twenty-Year-Old Banners Still Going Strong!

EEE Build



Install | Inspect | Improve

Get in Touch

At EEE Build, we specialize in delivering complex stage-engineering and structural installation projects across performance, heritage, and specialist environments. From precision acoustic systems and bespoke Unistrut frameworks to access safety solutions and technical infrastructure, our team combines engineering expertise with practical site experience.

Whether adapting historic buildings like LSO St Luke's or constructing new performance spaces, we manage every stage of the process — from planning and coordination through design, fabrication, and installation — with accuracy, safety, and accountability at the core.

To learn more about our capabilities or discuss how EEE Build can support your next project, visit our Services page or contact our team directly.

EEE Build Ltd.

Install, inspect, Improve!

Stage engineering - Rigging and Lifting - Modular Structures - Inspections - consultancy



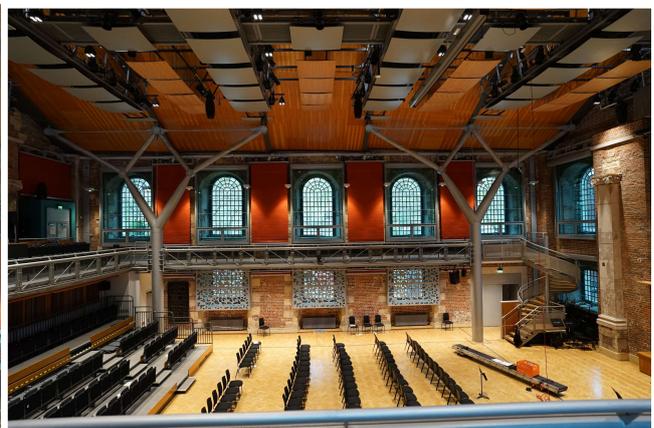
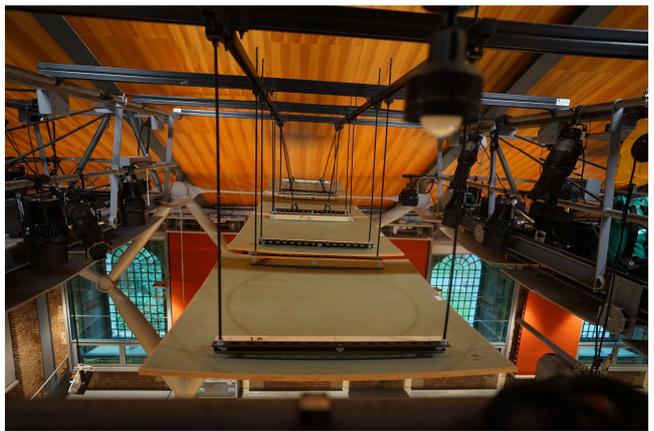
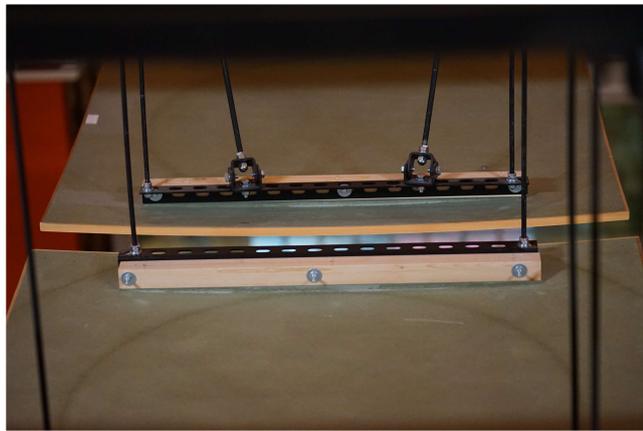
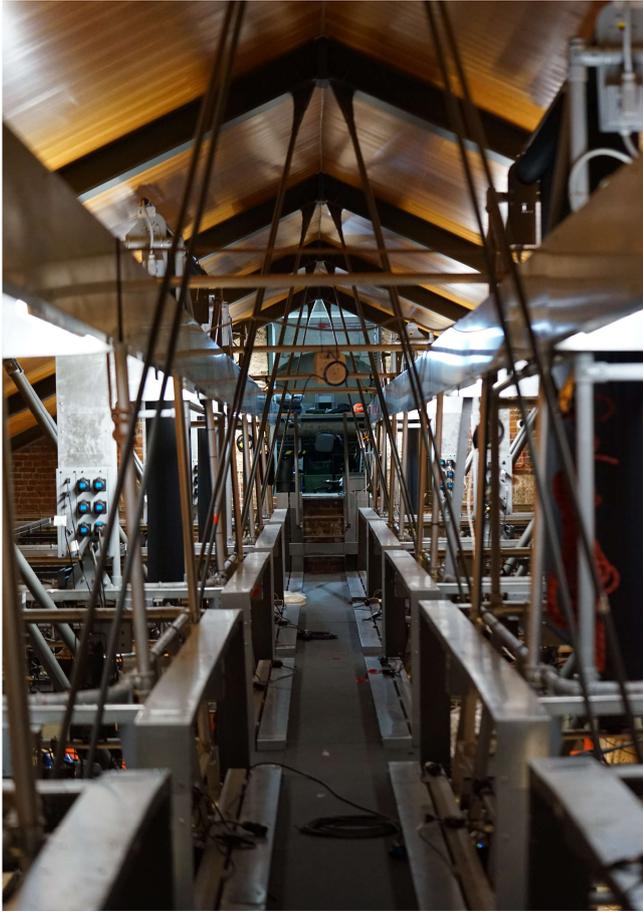




Image Gallery

Images courtesy of the London Symphony Orchestra / David Levene, additional photography by EEE build ltd.