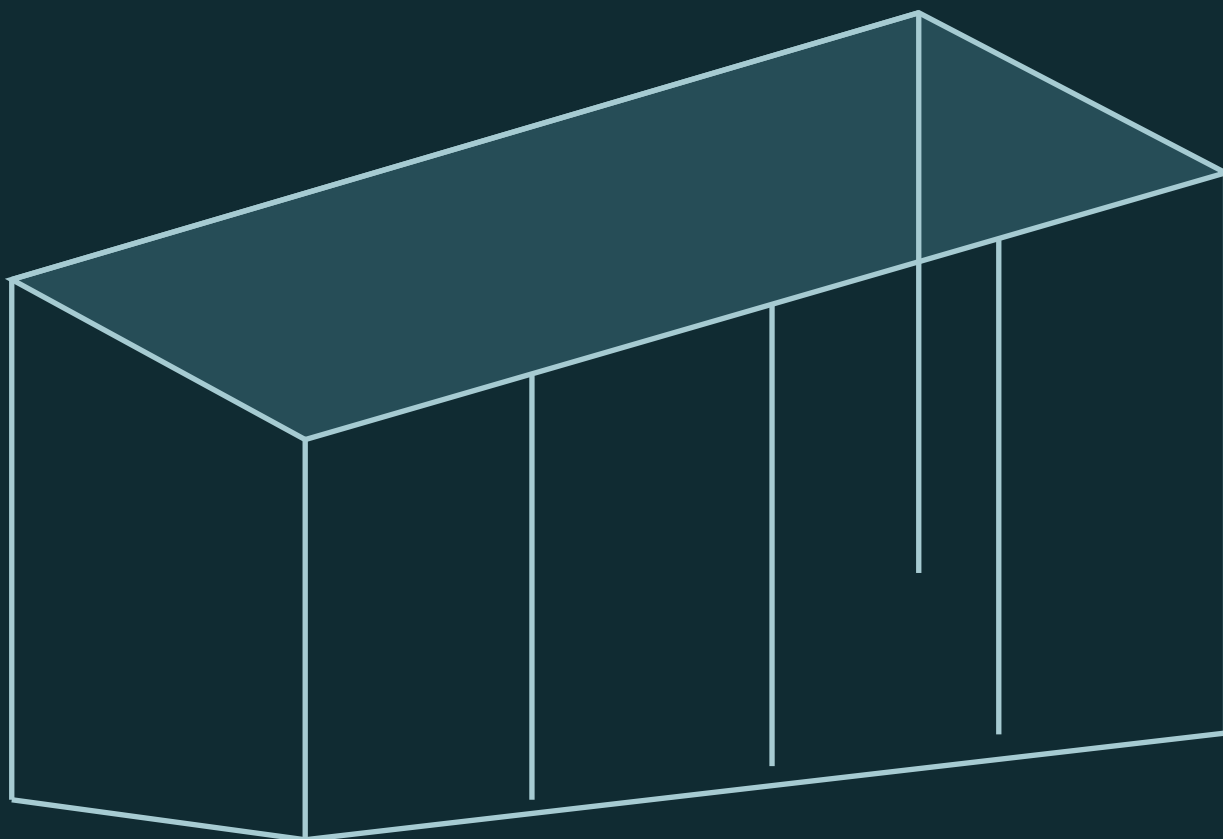


ARCHITECTURAL DESIGN SERIES / UNITED KINGDOM

STRUCTURAL GLASS

BUYERS & DESIGN GUIDE



GLASS ROOFS / EXTENSIONS / BALUSTRADES / FIRE-RATED SYSTEMS

Design principles, performance, safety and UK regulatory guidance

Technical edition • October 2026

THE ARCHITECTURAL POSSIBILITIES

Structural glass creates bright, contemporary spaces while reducing the visual interruption of conventional frames.

Explore rooflights, side returns, glazed links, extensions and internal glass features. Successful projects balance transparency with structure, safety, energy and buildability.

DESIGN & PROCUREMENT NOTES

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02 Request evidence for the complete installed system, including supports, fixings and interfaces.

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SPECIFICATION REMINDER

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WHAT IS STRUCTURAL GLASS?

Structural glazing describes systems in which glass, its connections and supporting components perform an engineered architectural role.

It does not mean that every glass panel is load-bearing. Some systems are supported by concealed steel or aluminium, while others use engineered glass fins or beams. The load path must be established by the designer.

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DESIGNING A GLASS EXTENSION

Start with the intended use, existing structure and site constraints before selecting glass.

Consider foundations, drainage, roof falls, thermal envelope, ventilation, overlooking, access, cleaning and how the new construction interfaces with the existing building. Planning permission and Building Regulations approval are separate questions.

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FRAMELESS GLASS ROOFS

Glass-to-glass joints can give a clean, almost uninterrupted view of the sky.

A visually frameless roof still needs a verified support arrangement, structural silicone or appropriate joint design, safe glazing specification, movement accommodation and weatherproofing. Design for maintenance and safe access.

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SIDE RETURN GLAZING

A side-return roof can introduce daylight deep into a terraced or semi-detached property.

Assess the party wall, existing foundations, rainwater routes, structural openings and available headroom. A roof lantern, fixed roof glazing or a glass-to-glass roof may be suitable depending on geometry and performance.

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GLASS BOX EXTENSIONS

Glass walls and roof panels can create a highly transparent architectural addition.

The apparent simplicity masks complex detailing at corners, perimeter seals, structural junctions, thresholds and roof drainage. Thermal bridging and summer overheating need particular attention.

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GLAZED LINKS AND CORRIDORS

Transparent links can connect old and new buildings with a light-touch appearance.

Movement joints are critical where structures settle or expand differently. Check fire separation, means of escape, accessibility, condensation risk and appropriate guarding.

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STRUCTURAL GLASS FLOORS

Walk-on glass requires a project-specific structural and slip-resistance design.

Specify laminated assemblies with suitable post-breakage capacity and verified support conditions. Design for concentrated loads, deflection, impact, edge protection, surface finish and replacement strategy. Never select thickness from a generic chart alone.

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GLASS BALUSTRADES AND GUARDING

A transparent balustrade is a safety-critical barrier, not simply a decorative screen.

Confirm required barrier height and horizontal loading for the occupancy and location. BS 6180 and the relevant structural loading standards are common design references. Account for post-breakage retention and fixing substrate.

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GLASS STAIRS AND TREADS

Glass stair elements demand careful engineering and a robust maintenance plan.

Consider slip resistance, edge visibility, concentrated loading, redundancy, handrails and the supporting structure. Accessible design and stair geometry are governed by separate provisions as well as glazing safety.

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GLASS FINS, BEAMS AND CANOPIES

Engineered glass members can support glazing or provide a transparent architectural feature.

Check buckling, connection stresses, load duration, temperature, impact, redundancy and residual capacity. External canopies require wind uplift, snow, drainage and accidental action assessments.

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ANNEALED, TOUGHENED AND HEAT-STRENGTHENED

The manufacturing process changes the behaviour of glass in service and on breakage.

Annealed glass can form sharp shards; thermally toughened safety glass breaks into smaller fragments; heat-strengthened glass has different breakage behaviour and is not automatically safety glazing. Verify the actual product classification and application.

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LAMINATED SAFETY GLASS

Laminated glass combines glass plies with one or more interlayers.

Interlayers can help retain fragments after breakage, but residual strength varies by interlayer, temperature, support and load duration. Laminated glass is often central to overhead, guarding and walk-on applications, subject to engineering verification.

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INSULATED GLASS UNITS

Double- and triple-glazed units can improve thermal performance.

Specify complete unit construction, cavity gas, low-emissivity coating, spacer, edge seal, solar-control performance and condensation considerations. BS EN 1279 addresses insulating glass units; structural applications may require additional assessments.

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SOLAR CONTROL AND OVERHEATING

A highly glazed design must be comfortable in both winter and summer.

Assess whole-building overheating under the applicable Part O or other relevant requirements and project methodology. Orientation, g-value, external shading, ventilation, thermal mass and occupant use matter. Lower g-value is not automatically better in every orientation.

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ACOUSTIC AND PRIVACY GLASS

Glazing can be designed for sound reduction and visual privacy.

Specify acoustic performance for the complete installed assembly, including seals and flanking paths. Acoustic laminated glass, interlayer selection and asymmetric glass build-ups may help. Privacy can involve fritting, interlayers, obscuration or switchable systems.

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FIRE-RESISTANT GLASS: E, EW AND EI

Fire-resistant glazing must be selected as a tested and classified system.

E denotes integrity; EW denotes integrity with radiation control; EI denotes integrity with insulation. Ratings such as EI30 or EI60 refer to classified minutes under the relevant test and classification regime, not to a generic glass pane that can be placed in any frame.

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FIRE-RESISTANT GLAZING DETAILS

The frame, glass, beads, seals, fixings and surrounding construction work together.

Check BS EN 13501-2 classifications, relevant test evidence, field of application, maximum dimensions, orientation and installation instructions. Fire doors, screens, floors and roofs may require different evidence. Never substitute components without approved supporting evidence.

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BUILDING REGULATIONS: ENGLAND

Approved Documents provide guidance on ways of meeting legal requirements; they are not a universal prescriptive specification.

Part A: structure; Part B: fire safety; Part K: impact, guarding and collision; Part L: energy; Part O: overheating where applicable; Part F: ventilation; Part M: access; Part Q: security where applicable. Confirm edition, commencement and transitional arrangements for the project.

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UK NATIONS AND PRODUCT COMPLIANCE

Building control requirements vary across the four UK nations.

England and Wales have separate guidance and amendment histories; Scotland uses its Building Standards Technical Handbooks; Northern Ireland has its own Building Regulations and technical booklets. Confirm the authority having jurisdiction. Check current UK construction product marking and declarations under applicable rules.

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KEY GLASS STANDARDS

Use standards to frame the design brief, not as substitutes for structural calculations.

BS 6262 series: glazing selection and applications; BS EN 12600: pendulum impact classification; BS EN 12150: thermally toughened glass; BS EN 14179: heat-soaked toughened glass; BS EN 14449 and BS EN ISO 12543: laminated glass; BS EN 1279: IGUs; BS EN 356: attack resistance.

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ENGINEERING, LOADS AND MOVEMENT

Structural glass must be checked for all relevant actions and serviceability criteria.

Typical considerations include self-weight, wind, snow, imposed loads, impact, thermal stresses, support settlement and differential movement. Obtain project-specific structural calculations, appropriate Eurocode-based loading and connection details from a competent engineer.

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INSTALLATION AND QUALITY ASSURANCE

Excellent glass design can fail through poor installation or incompatible materials.

Check survey dimensions, tolerances, lifting method, edge protection, setting blocks, sealant compatibility, water management and safe sequencing. Record product identification, batch traceability, test evidence, installation photographs and handover documents.

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THE BUYER'S CHECKLIST

Compare quotations on performance and evidence, not just glass thickness or price.

Request drawings, structural design responsibility, glazing make-up, safety classifications, fire test scope where relevant, whole-unit U-value, solar performance, warranties, lead times, access equipment, drainage details, maintenance plan and the approvals pathway.

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PROJECT PROCESS AND HANDOVER

A successful structural glazing project follows a staged, documented process.

Brief and feasibility; measured survey; planning and Building Regulations strategy; engineering and specification; coordinated shop drawings; procurement; installation; inspection and certification; operation and maintenance. Retain as-built details and replacement glass specifications.

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TECHNICAL SOURCES AND IMPORTANT LIMITS

This guide is educational and is not a certificate of Building Regulations compliance.

Primary sources: GOV.UK Approved Documents B, K, L and Q; [legislation.gov.uk](https://www.legislation.gov.uk) Building Regulations 2010; BSI standards catalogue; relevant building standards guidance in Scotland, Wales and Northern Ireland. A competent designer, fire engineer and building control body must assess each project.

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PRIMARY REFERENCE LINKS