BEFORE

AFTER

JB BUILDING PROJECTS

Huxley Close Garage Conversion

A Detailed Design, Build And Building Regulations Case Study

Full Single Garage Conversion | Structural RSJ Knockthrough | Family Playroom

DRAFT FOR REVIEW

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How To Read This Case Study

A project-specific account of how an attached single garage was converted into a bright, connected family room.

This document combines the project photo record with a plain-English explanation of the build sequence. Each construction stage explains what was done, why it mattered, the quality checks that should be made and the Building Regulations areas most likely to be relevant.

Important Context

The case study records the known project scope and what can be seen in the supplied photographs. It is not a structural calculation, product schedule, inspection record or completion certificate. Exact specifications and compliance evidence should always be checked in the project file and with the relevant Building Control body.

From Cold Garage To Connected Family Room

The project transformed a single attached garage into a warm, daylit playroom integrated with the existing home.

Project Type
Full single garage conversion

Primary Use
Family playroom / flexible living space

Key Structure
RSJ knockthrough and truss-to-cut vaulted roof

External Change
Garage door replaced with brickwork and a new window

Daylight
Front window, two VELUX windows and bifolding doors

Finish
Levelled downstairs floor with herringbone LVT

THE CLIENT BRIEF

The objective was not simply to make the garage presentable. The new room needed to feel like a permanent part of the house: warm enough for year-round family use, bright despite the deep footprint, directly connected to the existing accommodation and finished to the same domestic standard as the adjoining rooms.

THE TECHNICAL RESPONSE

The solution combined verified block-and-beam support, a rebuilt front elevation, a truss-to-cut vaulted roof, two VELUX windows, bifolding doors, a detailed PIR envelope and an RSJ opening. The connected downstairs floor was then levelled and finished in herringbone LVT.

What Makes This A Flagship Project

The project demonstrates the difference between decorating a garage and properly converting it. The structural opening, thermal envelope, controlled fittings, moisture strategy, daylight design and final joinery were treated as one coordinated system. The finished room is visually calm because the technical decisions were made before the finishes went on.

Before The Conversion

The garage was a sound starting shell, but it was not yet suitable for warm, comfortable or integrated living use.

The original unlined shell, exposed roof structure and garage-use finishes.

The existing single garage viewed from the driveway before conversion.

The original up-and-over garage door before the front elevation was rebuilt.

Internal view through the garage opening before the habitable-room envelope was formed.

Design And Compliance Strategy

The conversion was treated as a connected set of structural, moisture, thermal, ventilation, fire and electrical decisions.

DESIGN AREA	PROJECT RESPONSE	PRIMARY REFERENCE
Structure	RSJ knockthrough, front infill and altered openings	Part A
Moisture	Floor, external walls, roof and opening perimeters	Part C
Thermal	Insulated floor, walls, roof, window, rooflights and doors	Part L
Ventilation	Opening window and glazed garden doors for purge ventilation	Part F
Fire Safety	Linings, penetrations and protection to structure where required	Part B
Electrical	New circuits/accessories, inspection, testing and certification	Part P
Workmanship	Compatible products, sequencing, installation and snagging	Regulation 7

Why The Whole-System Approach Matters

The parts overlap. A rooflight affects structure, weathering, heat loss and ventilation. A structural opening affects stability, fire protection, services and finishes. A good conversion resolves these interfaces before they are hidden, then records the inspections and certifications needed for handover.

Opening Up And Structural Review

STAGE 01

The stripped garage shell exposed the existing roof, masonry and load paths for review.

WHAT WE DID

The garage was opened up so the existing walls, roof structure, thresholds and junctions could be seen clearly before they were enclosed. Local excavation established that the existing floor used a block-and-beam construction. The roof was also surveyed before the proposed vaulted conversion, allowing the team to base the structural, weathering and thermal sequence on the conditions actually found.

WHY THIS STAGE MATTERS

Garage conversions often fail when finishes are installed before the substrate has been properly understood. Opening up and trial excavation confirmed the available support, levels and load paths. This avoided an unnecessary new foundation and created a reliable basis for the front infill, altered roof, RSJ opening, insulation zones and new controlled fittings.

Quality Controls

- Check masonry condition and stability.
- Confirm block-and-beam floor and bearing points.
- Record roof geometry, levels and service routes.
- Keep temporary weather protection effective.

Building Regulations Context

Part A is relevant to stability and load transfer. Part C is relevant wherever opening-up reveals moisture, ground or weather-resistance risks. Approved Documents are guidance; project-specific design and Building Control decisions remain decisive. [2][4]

Truss-To-Cut Vaulted Roof Conversion

STAGE 02

The existing trussed roof was converted into a cut, vaulted pitched-roof arrangement.

WHAT WE DID

The existing trussed roof system was carefully altered to form a cut, vaulted pitched roof. New and retained timbers were coordinated to preserve the required load paths while opening the ceiling volume. The altered structure also incorporated the positions of the two VELUX roof windows, insulation zones, ventilation route and the later plasterboard lining.

WHY THIS STAGE MATTERS

Retaining a low trussed ceiling would have restricted the room's height and made the former garage feel enclosed. The vaulted design uses the pitched roof volume to provide substantially more vertical space, better proportions and a stronger sense of openness while retaining a rational structural system.

Quality Controls

- Altered rafters and supports follow the structural design.
- VELUX positions coordinated with the cut roof.
- Existing weather layer remains continuous.
- Insulation and 50 mm ventilation route allowed for.

Building Regulations Context

Part A covers the altered roof structure, loading and load transfer. The truss-to-cut conversion must follow project-specific structural design. Parts C and L address roof weather resistance, condensation risk and the performance of the upgraded thermal element. [2][4][6]

Garage Door Removal And Front Elevation

STAGE 03

The garage door zone was prepared for a permanent insulated masonry-and-window frontage.

WHAT WE DID

The original garage door was removed and the opening was prepared for a permanent external wall. Trial excavation confirmed that the existing block-and-beam floor arrangement provided suitable support for the proposed infill. A separate strip foundation was therefore not required for this project, subject to the project design and Building Control assessment.

WHY THIS STAGE MATTERS

Where suitable existing support is absent, garage-door infill commonly requires excavation and a concrete foundation, often approximately 500-1000 mm deep depending on ground conditions, loading and Building Control requirements. Confirming the block-and-beam construction prevented unnecessary excavation here.

Quality Controls

- Opening dimensions and levels verified.
- Existing supports and foundation suitability checked.
- Damp-proofing coordinated with adjacent construction.
- Temporary security and weather protection maintained.

Building Regulations Context

Part A is relevant to stability and any new masonry loads. Part C is relevant to the damp-proof course, cavity/lining strategy and exposure to rain. Part L applies to the new wall and window. [2][4][6]

Front Infill, Brickwork And New Window

STAGE 04

Completed external frontage with new window, matched brickwork and drainage channel.

WHAT WE DID

The lower portion of the garage-door opening was rebuilt in masonry and a new window opening formed above, using the verified existing block-and-beam support rather than a new concrete foundation. The finished frontage was aligned with the existing building so the conversion reads as part of the house, while the window introduces useful daylight and an opening element for ventilation.

WHY THIS STAGE MATTERS

This detail has to work visually and technically. Matching coursing and proportions protects kerb appeal; proper sill, cavity, damp and perimeter details protect the new room. The window also supports daylight, purge ventilation and the feeling of a genuine living space rather than a sealed former garage.

Quality Controls

- Brick bond, coursing and pointing consistent.
- Sill and perimeter seals weathered.
- Thermal continuity around the reveal.
- Window operation and clear opening checked.

Building Regulations Context

Parts C, F and L are central: moisture resistance, ventilation and thermal performance. Part A remains relevant to the wall and opening. Exact window and wall specifications should be verified from the project file. [2][4][5][6]

Insulated Floor Build-Up And Levels

STAGE 05

The block-and-beam floor was upgraded with 70 mm PIR and insulated perimeter upstands.

WHAT WE DID

The block-and-beam floor was incorporated into the habitable-room envelope with 70 mm PIR insulation. Insulated upstands, 100 mm high, were installed at the floor perimeter to reduce heat loss where the floor meets the external brickwork. The build-up was coordinated with thresholds, wall linings and door openings.

WHY THIS STAGE MATTERS

The wall-to-floor junction can form a significant thermal bridge, often called a cold bridge, if insulation stops short at the perimeter. The upstands continue the thermal envelope at this junction, improving comfort and reducing the risk of cold internal surfaces and localised condensation.

Quality Controls

- Finished floor level set before lining.
- Moisture layer continuous at edges and penetrations.
- 70 mm PIR tightly fitted and fully supported.
- 100 mm perimeter upstands remain continuous.
- Door thresholds coordinated with final floor.

Building Regulations Context

Part C covers moisture resistance of floors. Part L covers heat loss through retained or upgraded floors. At the time of the work, Approved Document L Table 4.3 gave 0.25 W/(m²K) as the improved value for an existing floor where the guidance applied, subject to feasibility. [4][6]

Roof Insulation And Thermal Continuity

STAGE 06

The vaulted roof received 170 mm PIR in two layers while retaining a 50 mm ventilation route.

WHAT WE DID

The vaulted roof received 170 mm of PIR insulation in two coordinated layers: 100 mm between the rafters and a further continuous 70 mm layer beneath them. A 50 mm ventilation gap was maintained above the insulation and connected to the vented soffits, preserving airflow through the roof construction.

WHY THIS STAGE MATTERS

Timber rafters interrupt insulation installed only between the members and can create repeating cold bridges. The second 70 mm layer crosses the rafters to improve thermal continuity. The separate 50 mm airflow route helps manage condensation risk without sacrificing the designed insulation thickness.

Quality Controls

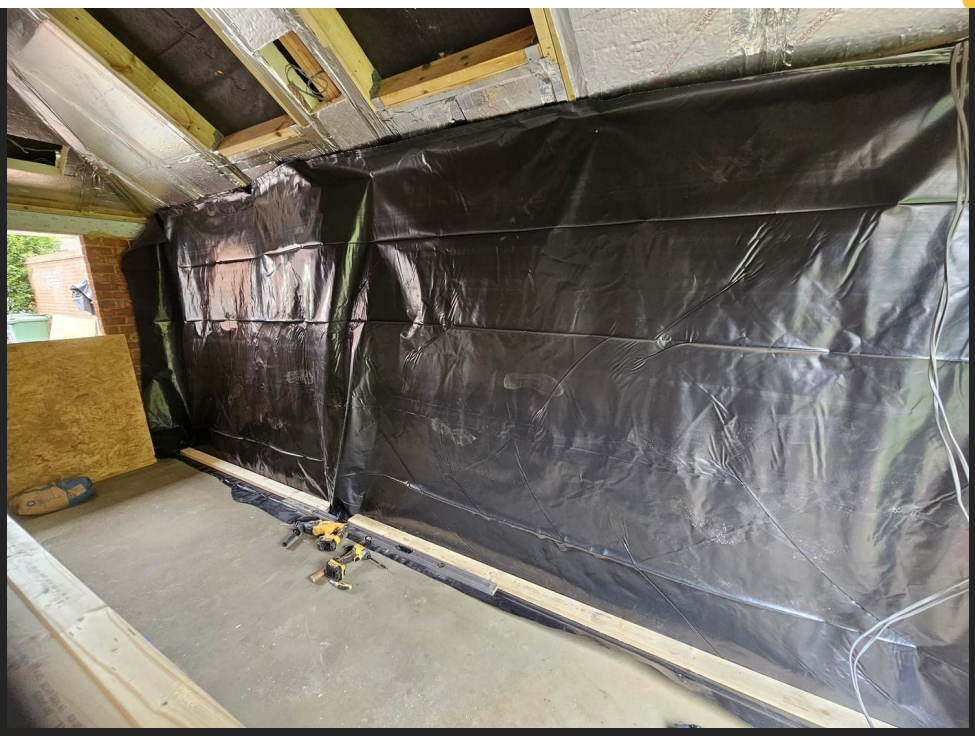
- 100 mm between-rafter PIR fitted without gaps.
- 70 mm continuous layer crosses the rafters.
- 50 mm airflow route reaches vented soffits.
- VELUX reveals retain thermal continuity.

Building Regulations Context

Part L addresses the roof's thermal performance and continuity. Part C addresses resistance to interstitial and surface condensation. Approved Document L Table 4.3 gave 0.16 W/(m²K) as the improved value for an existing roof where applicable in 2024. [4][6]

Wall Insulation And Moisture Control

STAGE 07



The wall build-up used 100 mm PIR with a 50 mm ventilated separation from the masonry.

WHAT WE DID

The existing garage walls were upgraded from their original non-habitable condition with an independent lined build-up containing 100 mm PIR insulation. A 50 mm gap was maintained between the new internal wall system and the existing masonry to provide the designed separation and additional ventilation. Framing also created straight wall lines and a coordinated route for services and finishes.

WHY THIS STAGE MATTERS

Wall performance depends on insulation continuity, moisture management and the way the new lining meets the floor, roof, window and structural opening. The 100 mm PIR forms the principal wall thermal layer, while the 50 mm separation helps keep the internal system clear of the original external masonry.

Quality Controls

- No trapped moisture behind the lining.
- 100 mm PIR continuous at corners and reveals.
- 50 mm separation maintained throughout.
- Air/vapour layer sealed at laps and edges.
- Timber kept clear of damp-prone junctions.

Building Regulations Context

Part C addresses resistance to moisture in walls. Part L covers heat loss and air infiltration. In 2024, Approved Document L Table 4.3 identified 0.30 W/(m²K) as the improved value for an internally or externally insulated existing wall where the guidance applied. [4][6]

Internal Framing And Service Zones

STAGE 08

Timber framing established straight wall lines and protected routes for services and finishes.

WHAT WE DID

Timber framing was formed to the perimeter and around openings to receive insulation, wiring, plasterboard and finished joinery. The framing also regularised the original garage shell, creating consistent reveals and reliable fixing points for sockets, switches, skirtings and later fitted elements.

WHY THIS STAGE MATTERS

A precise frame turns an irregular shell into a buildable interior. It protects the thermal layer from unplanned service penetrations, gives plasterboard proper support and allows openings to be finished symmetrically. Early coordination here determines how refined the completed room will feel.

Quality Controls

- Stud centres suit board edges and loads.
- Openings are square, plumb and coordinated.
- Service routes avoid structural members.
- Fire and air-sealing details remain accessible.

Building Regulations Context

Part 7 requires suitable materials and workmanship. Parts B and L influence lining continuity, service penetrations and the finished envelope. Part P governs electrical design, testing and notification where applicable. [1][3][6][7]

Two VELUX Roof Windows And Daylight

STAGE 09

JB Building Projects supplied and installed two VELUX roof windows in the new vaulted roof.

WHAT WE DID

JB Building Projects supplied and installed two VELUX roof windows within the new cut, vaulted pitched roof. Their positions were coordinated with the rafters, 170 mm insulation build-up and 50 mm ventilation route. Externally, proprietary flashings were integrated with the tiles; internally, the reveals were formed to distribute daylight through the room.

WHY THIS STAGE MATTERS

The original garage was deep and relatively enclosed. Rooflights transform the quality of the space by bringing light from above, reducing dependence on artificial lighting and making the new room feel taller. Their junctions must remain weather-tight and thermally continuous to perform well long term.

Quality Controls

- Flashings compatible with roof covering.
- Kerb and openings properly supported.
- Insulation returned into reveals.
- Internal finishes avoid cold ledges.

Building Regulations Context

Part A applies to altered roof structure. Parts C and L cover weather resistance, condensation and thermal performance. Rooflights are controlled fittings for Part L purposes, so their declared performance and installation details matter. [2][4][6]

Supplied And Fitted Bifolding Doors

STAGE 10

JB Building Projects supplied and fitted the bifolding doors to the new garden opening.

WHAT WE DID

JB Building Projects formed the garden opening, then supplied and fitted the glazed bifolding door system. The frame, threshold and folding leaves were coordinated with the supporting structure, external weathering, floor levels and internal linings so the installation performs as an integrated part of the converted room.

WHY THIS STAGE MATTERS

The doors give the room a second source of daylight, direct garden access and useful purge ventilation. The threshold and perimeter details are particularly important: they must balance weathering, security, thermal performance and a comfortable transition between inside and outside.

Quality Controls

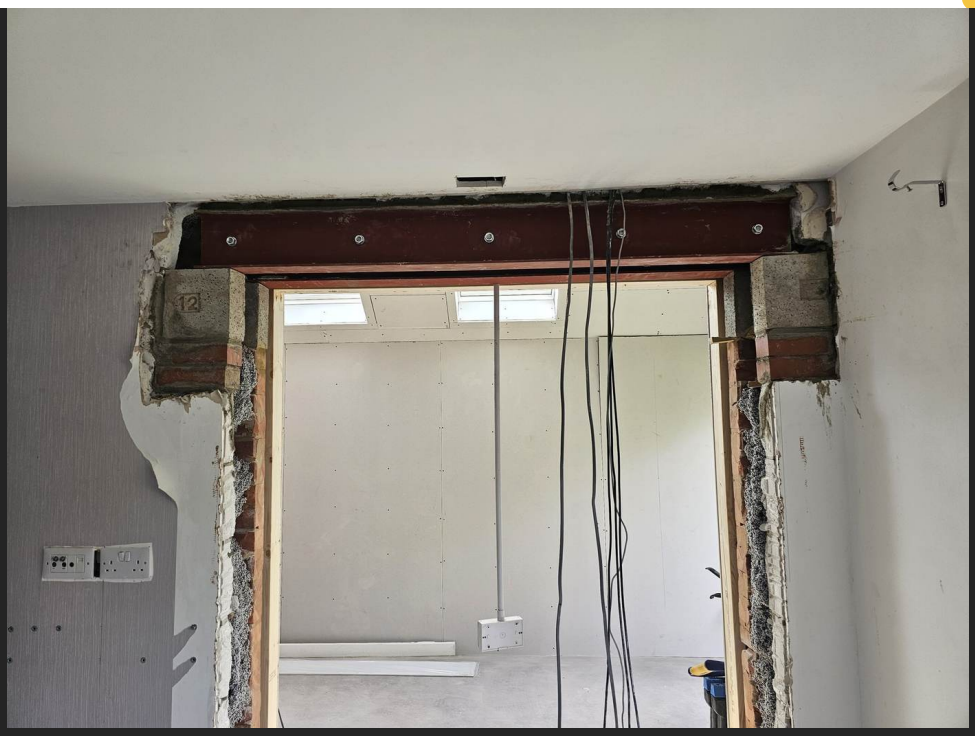
- Opening support and frame fixings verified.
- Sill, seals and drainage paths kept clear.
- Door leaves adjusted for smooth operation.
- Thermal and air seals continuous at perimeter.

Building Regulations Context

Part A is relevant to the enlarged opening. Parts C, F and L apply to weathering, ventilation and controlled fitting performance. Safety glazing and impact considerations should also be checked for the particular door system and locations. [2][4][5][6]

Structural Knockthrough And RSJ

STAGE 11



The structural opening was formed between the house and garage and supported with a steel beam.

WHAT WE DID

A large opening was created between the existing house and the converted garage. The masonry above was supported by a steel beam/RSJ with appropriate end support, allowing the finished rooms to connect through a broad opening instead of feeling like two separate spaces linked by a doorway.

WHY THIS STAGE MATTERS

This is the defining structural intervention in the project. Removing load-bearing masonry changes how loads travel through the building, so beam size, bearings, padstones, restraint and installation sequence must be based on project-specific structural information and executed without destabilising adjacent work.

Quality Controls

- Temporary support installed before demolition.
- Beam specification matches structural design.
- Bearings and padstones formed as detailed.
- Fire protection and finishes coordinated.

Building Regulations Context

Part A requires loads to be safely sustained and transmitted without impairing stability. Approved Document A references structural design standards, but the actual beam design and bearings must come from the project's structural calculations and Building Control review. [2]

Plasterboard, Linings And Fire Protection

STAGE 12

Plasterboard enclosed the insulated shell and shaped the rooflight and structural-opening reveals.

WHAT WE DID

Plasterboard was fixed across the walls and pitched ceiling, including the rooflight reveals and the new structural opening. Board joints, fixings and edges were coordinated with the framing so the lining formed a stable, continuous base for plaster and the required fire and surface performance.

WHY THIS STAGE MATTERS

The internal lining is not merely decorative. Correct board type, thickness, support, jointing and penetration treatment can contribute to fire protection, air tightness and acoustic comfort. Accurate boarding also determines the crispness of reveals and the final quality of a heavily daylit room.

Quality Controls

- Correct board specification for each location.
- Edges supported and fixing pattern consistent.
- Openings and penetrations neatly detailed.
- RSJ protection completed to design.

Building Regulations Context

Approved Document B gives guidance on fire safety in dwellings, including linings and structural fire protection where relevant. Part 7 requires suitable materials and workmanship. Project-specific fire details should be confirmed with Building Control. [1][3]

Plastering And Surface Preparation

STAGE 13

Plastering unified the new shell, rooflights and structural opening into a single finished interior.

WHAT WE DID

The boarded surfaces were jointed and plastered to create a continuous finish across walls, pitched ceilings, rooflight reveals and the knockthrough. The room was then allowed to dry before decoration, joinery and floor finishes were completed.

WHY THIS STAGE MATTERS

Drying time is a quality-control stage, not wasted programme. Applying paint, sealants or flooring too early can trap construction moisture or lead to movement and surface defects. Good preparation also allows natural light from the rooflights to reveal, and therefore improve, the final surface quality.

Quality Controls

- Backgrounds stable and free of loose material.
- Corners, beads and reveals straight.
- Adequate ventilation during drying.
- Moisture-sensitive finishes delayed until ready.

Building Regulations Context

Part 7 is relevant to workmanship and material suitability. Parts C and F remain relevant during drying because the build-up must manage moisture and the room must have effective ventilation. [1][4][5]

Self-Levelling And Herringbone LVT

STAGE 14

More than 50 m2 of the downstairs floor was levelled before the herringbone LVT installation.

WHAT WE DID

The entire connected downstairs floor area, exceeding 50 m2, was prepared with self-levelling compound to create a consistent plane through the house and conversion. Luxury vinyl tile (LVT) was then installed in a herringbone layout, with set-out coordinated across the RSJ opening, wall lines, doors and thresholds.

WHY THIS STAGE MATTERS

Herringbone LVT makes small differences in level or alignment immediately visible. Levelling the full downstairs area, rather than treating only the garage footprint, removed localised transitions and gave the pattern a stable, continuous substrate. The result visually connects the new room to the wider home.

Quality Controls

- More than 50 m2 checked and prepared.
- Self-levelling compound cured before covering.
- Pattern centred through key sight lines.
- Expansion and perimeter gaps maintained.
- Transitions and thresholds neatly finished.

Building Regulations Context

The decorative floor itself is principally a specification and workmanship matter, but the substrate and underlying build-up relate back to Parts C and L. Part 7 supports appropriate materials and competent installation. [1][4][6]

Second Fix, Joinery And Final Finishes

STAGE 15

Second-fix joinery, radiators, electrics and decoration completed the new family room.

WHAT WE DID

Internal doors, skirtings, electrical accessories, lighting, heating elements and decorations were completed after the main wet trades and floor installation. The final stage focused on alignment, operation, sealant lines, touch-ups and the small details that determine how finished the room feels.

WHY THIS STAGE MATTERS

Second fix is where technical work becomes a usable room. Coordinating trades prevents new finishes from being damaged and ensures sockets, heating, doors and trims work together. A structured snagging process then captures minor defects before handover and final sign-off.

Quality Controls

- Electrical work inspected and tested.
- Doors, windows and hardware operate smoothly.
- Heating and ventilation provisions functional.
- Snagging completed before final payment.

Building Regulations Context

Part P covers electrical safety in dwellings, including design, installation, inspection, testing and information. Parts F and L remain relevant to ventilation and energy performance. Certification should form part of the handover record where applicable. [5][6][7]

Building Control And Quality Checkpoints

Good outcomes depend on inspecting the work before each critical layer is hidden.

1	**Before Work**	Scope, drawings, structural information, application route and inspection plan agreed.
2	**Opening Up**	Existing structure, levels, damp risks and proposed junctions reviewed against assumptions.
3	**Foundations And Infill**	Any new load-bearing masonry support, damp details and cavity work checked before concealment.
4	**Structure**	RSJ, bearings, padstones, restraints and roof alterations reviewed against the structural design.
5	**Thermal Envelope**	Floor, wall and roof insulation, continuity, controlled fittings and air-sealing checked.
6	**First Fix**	Electrical routes, penetrations, ventilation provisions and service coordination reviewed.
7	**Pre-Plaster**	Board types, fire protection, framing, openings and photographic evidence recorded.
8	**Completion**	Testing, certifications, snagging and completion documentation assembled for handover.

Completion Evidence

A strong handover pack can include structural calculations, Building Control correspondence or completion certificate, electrical certification, product information, photographs of concealed work and any maintenance instructions. The exact documents depend on the project and approval route.

Completed Result 1

All supplied After photographs are included

A generous structural opening makes the new room feel connected to the home rather than added on.

Completed Result 2

All supplied After photographs are included

The former garage door is now a warm, insulated wall with a proportioned window and useful daylight.

Completed Result 3

All supplied After photographs are included

Rooflights, a calm finish palette and durable flooring turn the garage footprint into a bright family playroom.

What The Finished Project Achieved

The value is not only extra floor area; it is a better connected, better lit and more useful home.

01 A True Living Space

The room has domestic finishes, heating, lighting, ventilation and a coordinated insulated envelope.

02 Connection To The Home

The RSJ knockthrough removes the visual and practical separation created by a narrow doorway.

03 Daylight From Three Directions

Front window, rooflights and garden doors prevent the deep plan from feeling dark.

04 Practical Family Use

Durable flooring, open sight lines and direct garden access support everyday use as a playroom.

05 External Integration

Matched brickwork and a proportioned front window make the conversion read as part of the house.

06 Inspectable Work

The photo record captures key concealed stages and supports a more transparent handover conversation.

The Core Lesson

The most convincing garage conversions are designed from the inside out and the outside in at the same time. Structure, moisture, heat, air, daylight, services and finishes must meet at the same junctions. When those interfaces are resolved early, the final room feels simple.

Building Regulations Reference Guide

The principal Approved Documents relevant to the work shown in this case study.

Part A - Structure	Load paths, steel beam design, openings, walls, floors, roofs and foundations.	Stages 1-4, 9-11
Part B - Fire Safety	Internal linings, penetrations and protection of structural elements where required.	Stages 8, 11-12
Part C - Moisture	Resistance to moisture through floors, walls and roofs; damp and condensation control.	Stages 1-7, 9-10
Part F - Ventilation	Indoor air quality, background/purge ventilation and additional habitable rooms.	Stages 4, 10, 13, 15
Part L - Energy	Thermal elements, controlled fittings, air leakage and building services in existing dwellings.	Stages 3-10, 14-15
Part P - Electrical	Safe design, installation, inspection, testing, notification and information.	Stages 8 and 15
Regulation 7	Materials must be suitable and adequately prepared, applied and fixed for their intended use.	All stages

2024 Project Context

The project photographs record work carried out during 2024. The main energy and ventilation references then in force were the 2021 editions of Approved Documents L and F, including applicable amendments. Building standards evolve, so every future conversion must be checked against the editions and transitional arrangements applying to that new project.

Official Sources, Limitations And Next Step

All regulatory links below are official GOV.UK sources for England.

[1] Approved Documents Collection	Official index to statutory guidance supporting the Building Regulations in England.
[2] Approved Document A - Structure	Structure, loading, walls, floors, roofs, openings and foundations.
[3] Approved Document B - Fire Safety	Fire safety guidance for dwellings, including linings and protection of structure.
[4] Approved Document C - Moisture	Moisture resistance of floors, walls and roofs, damp proofing and related provisions.
[5] Approved Document F - Ventilation	Ventilation and indoor air quality, including guidance for additional habitable rooms.
[6] Approved Document L - Energy	Energy performance of existing dwellings, retained elements, openings and building services.
[7] Approved Document P - Electrical Safety	Electrical safety, notification, inspection, testing and provision of information.
[8] Building Regulations Approval	Official overview of when approval may be needed and how Building Control approval differs from planning.

Limitations Of This Draft

This marketing case study is not a design certificate or legal opinion. It does not replace drawings, structural calculations, thermal calculations, product data, electrical certification, inspection notes or a Building Control completion certificate. The final published version should be checked against the project record before it is described as evidence of any exact specification or approval outcome.

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