Full Building Specification

Regulatory Framework: UK Building Regulations (Current Approved Documents A, B, C, F, H, K, L, P, Q, and 7)

1. Roof Construction (Sloping Ceilings)

Roof Coverings: Supply and fix plain concrete or clay roof tiles to match the existing house. Fix tiles with aluminium or alloy nails in accordance with the manufacturer's specification and BS 5534.

Battens: Install 25 × 38 mm pressure-treated softwood (SW) tiling battens. Securely nail battens at centres required by the tile gauge.

Underlay: Lay a BBA-approved vapour-permeable (breathable) roofing membrane horizontally over rafters. Provide a minimum 150 mm horizontal lap and drape the membrane slightly between rafters to allow water runoff.

Timber Structure: Install 175 × 50 mm graded softwood rafters (minimum C24 grade) fixed at maximum 600 mm centres. All structural timbers must be treated with a chemical preservative.

Insulation: Fit rigid polyisocyanurate (PIR) insulation boards (such as Celotex or Kingspan) tightly between the rafters. To prevent thermal bridging and achieve required U-values, install a continuous layer of insulated plasterboard under the rafters. Leave a minimum 50 mm ventilated airspace above the insulation if required by the membrane manufacturer, or install full-fill if using a fully certified non-ventilated system.

Ceiling Finish: Fix 12.5 mm tapered-edge foil-backed plasterboard to the underside of the rafters/counter-insulated layer. Seal all joints with scrim tape and finish with a 3 mm multi-finish plaster skim coat.

2. External Cavity Walls

External Render: Apply a 3 mm proprietary polymer-modified thin-coat silicone or acrylic render system over a reinforcing fibreglass mesh basecoat. The system must be applied strictly in accordance with the manufacturer's guidelines for external wall insulation (EWI).

External Insulation: Install 50 mm Expanded Polystyrene (EPS) insulation boards. Mechanically fix and bond the boards using a premium adhesive compound directly to the outer face of the external blockwork leaf.

External Leaf: Construct a 100 mm solid concrete blockwork outer leaf (minimum 7.3 N/mm² compressive strength). Lay blocks in a 1:1:6 cement/lime/sand mortar mix (Designation iii).

Cavity Insulation: Provide a 150 mm wide cavity completely filled with 150 mm PIR full-fill cavity insulation boards (e.g., Kingspan Thermawall TW50 or equivalent BBA-approved cavity boards). Ensure boards are tightly butted with staggered vertical joints.

Internal Leaf: Construct a 100 mm lightweight concrete blockwork inner leaf (minimum 3.6 N/mm² compressive strength, thermal conductivity λ ≤ 0.15 W/mK).

Wall Ties: Install stainless steel structural cavity wall ties spaced at maximum 750 mm horizontal and 450 mm vertical centres. Provide additional ties at a maximum 300 mm vertical spacing around window and door openings.

Internal Finish: Apply a two-coat plaster system consisting of a backing coat (e.g., British Gypsum Thistle BondingCoat) followed by a 2 mm high-quality multi-finish plaster skim.

3. Ancillary Wall Works

Damp-Proof Course (DPC): Install a continuous polypropylene or high-performance polyethylene DPC. The DPC must be positioned at least 150 mm above the finished external ground level. Lap it at least 150 mm at joints and seal with the internal damp-proof membrane (DPM).

Cavity Trays and Closers: Install insulated cavity closers at all window and door reveals to arrest thermal bridging. Fit flexible vertical DPCs behind all openings and provide proprietary stepped cavity trays with weep holes above structural lintels.

4. Strip Foundations & Groundworks

Excavation: Excavate trenches to a minimum depth of 1000 mm below finished ground level, or until a load-bearing strata is reached. Increase depth as required by the Local Authority Building Control (LABC) or if trees are nearby to counter clay shrinkage (NHBC Chapter 4.2).

Trench Dimensions: Standard trench width must be a minimum of 600 mm to accommodate the 400 mm total wall width, leaving a minimum 100 mm concrete projection on either side of the blockwork.

Concrete Specification: Pour a minimum 225 mm thick mass concrete strip foundation using GEN3 (C20) structural concrete. Ensure the concrete is level, fully compacted, and allowed to cure before laying any masonry.

Stepped Foundations: If the site slopes, foundations must be stepped. Steps must not exceed the thickness of the foundation concrete and must overlap by a minimum of twice the height of the step, or 300 mm (whichever is greater).

Below-Ground Masonry: Construct foundation walls up to the damp-proof course (DPC) using dense aggregate concrete blocks (minimum 7.3 N/mm² compressive strength) laid in a 1:4 cement/sand mortar (Designation i).

5. Windows and External Doors

Thermal Performance (Part L): All new windows and external doors must achieve high-efficiency thermal performance. Windows must achieve a maximum U-value of 1.4 W/m²K (or a Window Energy Rating of Band B). External doors must achieve a maximum U-value of 1.4 W/m²K (including the frame).

Glazing Specification: Supply and install factory-glazed, argon-filled double or triple-glazed units. Units must feature low-emissivity (Low-E) glass and warm-edge spacer bars.

Safety Glazing (Part K): Provide toughened or laminated safety glass complying with BS EN 12150 in "critical locations." This includes all glazing within 800 mm of the finished floor level, and any glazing within 300 mm of a door leaf up to 1500 mm above floor level.

Security (Part Q): All ground-floor windows and accessible external doors must be manufactured and tested to meet secure design standards. They must achieve PAS 24 certification (or equivalent) and feature multi-point locking systems.

Ventilation (Part F): Provide background ventilation via controllable trickle vents built into the window frames. Provide a minimum of 8,000 mm² equivalent area (EQA) of ventilation for habitable rooms, and 4,000 mm² for wet rooms or kitchens.

Installation and Seals: Fix frames securely using galvanised steel fixing straps or direct frame screws at maximum 600 mm centres. Seal the perimeter using low-modulus silicone sealant over a backing cord to ensure an airtight, weatherproof finish.

6. Concrete Floor Slab & Insulation Connection

Sub-Base & Membrane: Lay a minimum 150 mm well-compacted, clean, inert hardcore sub-base, blinded with fine sand. Install a 1200-gauge heavy-duty polythene Damp-Proof Membrane (DPM) across the entire floor area. Overlap the DPM by a minimum of 150 mm at any seams, seal with structural tape, and lap it up the internal walls to link continuously with the wall Damp-Proof Course (DPC).

Concrete Slab: Pour a minimum 100 mm thick solid concrete floor slab over the blinded sub-base using a GEN3 (C20) concrete mix, fully compacted and finished level.

Floor Insulation: Install rigid polyisocyanurate (PIR) floor insulation boards (e.g., Celotex or Kingspan) over the concrete slab. The insulation must achieve a maximum U-value of 0.13 W/m²K to comply with Approved Document L standards. Ensure all insulation boards are tightly butted together with staggered vertical joints.

Perimeter/Edge Insulation: Provide a continuous 25 mm strip of vertical rigid PIR insulation around the entire perimeter of the floor slab. This edge insulation must extend from the top of the main floor insulation down to the concrete slab, sitting flush between the wall's lightweight blockwork inner leaf and the floor finishes to eliminate cold bridging.

Screed Finish: Lay a 65 mm traditional sand and cement finishing screed over a polythene separating layer placed on top of the PIR boards. Increase screed depth to 75 mm if integrating underfloor heating pipes.

7. Structural Lintels

Lintel Specification: Install insulated, high-performance, galvanised steel cavity lintels (such as Catmic or Birtley) over all new window and door openings. Select lintel profiles configured explicitly for a 150 mm cavity width.

End Bearings: All lintels must have a minimum end bearing of 150 mm onto the masonry on both sides of the opening, bedded on a solid 1:3 cement mortar mix.

Thermal Bridging & Cavity Closers: Use lintels with built-in rigid EPS thermal insulation cores to eliminate cold bridges across the cavity. Install continuous insulated cavity closers at all window and door reveals.

Damp Proofing: Install a flexible, high-performance polyethylene cavity tray directly above each lintel. The tray must extend 150 mm beyond the ends of the lintel and feature a forward-facing lip to direct moisture outwards. Provide a minimum of two proprietary weep holes per opening to drain the cavity tray.

8. Breakthrough Junction (Extension to Existing House)

Structural Openings: Prior to knocking through, install temporary adjustable steel props (Acrow props) and strongboys to fully support the existing house floors, masonry walls, and roof loads.

Structural Beams: Install structural steel beams (Universal Beams/UCs) designed and sized by a qualified structural engineer to safely bridge the new openings. Secure beams on engineering brick padstones (minimum 7.3 N/mm²) bedded on high-strength mortar.

Movement/Expansion Joint: Tie the new 400 mm extension walls to the existing house using stainless steel wall starter profiles (e.g., Ancon or Catmic wall connectors). Do not bond the masonry. Incorporate a continuous, weather-tight 10 mm vertical expansion joint packed with compressible joint filler and sealed externally with a high-modulus, flexible silicone sealant to accommodate natural differential settlement.

DPC/DPM Continuity: Cut a vertical chase into the existing house wall at the junction. Slot a continuous vertical DPC into the chase to isolate the new extension walls from the existing masonry, ensuring this vertical barrier overlaps the horizontal floor DPM and wall DPC lines.

Weathering and Flashing: Where the new single-storey extension roof meets the existing vertical brick wall, install a continuous Code 4 lead step-and-cover flashing. Rake out mortar joints to a depth of 25 mm, insert the lead flashing, secure with lead wedges, and point with high-performance lead sheet sealant.

9. Drainage Requirements

Rainwater System: Install half-round uPVC gutters (minimum 100 mm diameter) along the new eaves. Connect these to 68 mm diameter uPVC downpipes. Rainwater must discharge into a new or existing surface water soakaway or a dedicated surface water sewer. Do not connect rainwater systems to a foul water sewer unless specifically approved by the local water authority.

Soakaway Design: Position any new surface water soakaway a minimum of 5.0 metres away from the foundations of the extension and any neighbouring structures. Construct the soakaway using proprietary geocellular crates wrapped in a permeable geotextile membrane, sized to suit local soil infiltration rates.

Foul Drainage: Lay all new below-ground foul drainage pipes using 110 mm diameter terracotta uPVC pipes. Pipes must be laid to a minimum gradient of 1:40 (or 1:80 if serving at least one WC) on a 100 mm bed of pea gravel.

Inspection Chambers: Install a new proprietary plastic inspection chamber (manhole) at any change of direction, gradient, or at the junction where the new extension foul line connects to the existing private drainage system. Ensure the cover is airtight and load-rated for its specific location (e.g., pedestrian or driveway loading).

Building Regulations (Part H): All drainage works must comply with Approved Document H. Provide access for rodding and testing on all new pipe runs.

10. Structural Steelwork Notes

Engineer Calculations: The exact structural steel beam profiles, column sizes, splice details, and padstone dimensions are subject to final design and verification by a qualified Structural Engineer. Their site-specific calculations and drawings must be submitted to and approved by Building Control prior to the commencement of any breakthrough works.

General Steel Specification: All structural steel sections must be minimum Grade S275 to BS EN 10025. Steelwork must be thoroughly cleaned of rust and scale, then coated with one coat of zinc-phosphate red oxide primer before delivery to the site.

Padstones: Support all structural steel beams on pre-cast concrete padstones (minimum compressive strength 40 N/mm²) or high-density engineering bricks (minimum 75 N/mm²) bedded in a 1:3 cement mortar mix.

Fire Protection (Part A & B): To achieve a minimum of 30 minutes of fire resistance, encase all structural steel beams and columns within the extension or breakthrough opening with two layers of 12.5 mm fire-resistant plasterboard (e.g., British Gypsum Gyproc FireLine). Stagger all board joints, secure them with mechanical drywall screws, and finish with a 3 mm multi-finish plaster skim. Alternatively, apply an approved intumescent paint system strictly to the manufacturer's specified dry film thickness (DFT).

11. Electrical and Lighting Specification (Part P)

Competent Person Scheme: All electrical installation, wiring, and testing works must be carried out by a competent person registered with a government-approved Part P scheme (e.g., NICEIC or NAPIT). Upon completion, a BS 7671 Electrical Installation Certificate and a Building Regulations Compliance Notice must be issued to the homeowner and Building Control.

Energy-Efficient Lighting (Part L): All new internal light fittings must be high-efficiency luminaires. Supply and install fixed low-energy light fittings (such as integrated LED downlights or dedicated LED pendants) that achieve a minimum luminous efficacy of 75 light source lumens per circuit watt to comply with Approved Document L standards.

Circuits and Accessories: Extend the existing consumer unit to accommodate new, dedicated ring or radial circuits for the extension's socket outlets and lighting loops. Ensure all new circuits are protected by a 30mA Residual Current Device (RCD) or Residual Current Breaker with Overcurrent protection (RCBO).

Smoke Alarms: If the extension impacts existing escape routes, install a mains-powered, interconnected smoke/heat alarm system with battery backup complying with BS 5839-6.

12. Heating, Ventilation, and Mechanical Extract Fans

Heating System Extension: Extend the existing gas-fired central heating system into the new extension. Install high-efficiency steel panel radiators or a low-profile wet underfloor heating (UFH) system. The heating system must be zoned and controlled independently of the main house using a programmable room thermostat and Thermostatic Radiator Valves (TRVs) to comply with Approved Document L standards.

Underfloor Heating (if applicable): Lay UFH barrier pipes over the floor insulation layer using proprietary tracking or clipping systems. Pipes must be spaced and sized according to the heating engineer's layout and connected to a dedicated UFH manifold with its own mixing valve and pump.

Background Ventilation (Part F): Provide background ventilation to all habitable spaces via controllable trickle vents integrated into the window frames. Habitable rooms must have a minimum total equivalent area (EQA) of 8,000 mm² of ventilation, while wet areas (bathrooms/utility) must have a minimum of 4,000 mm².

Purge Ventilation: Ensure all new windows and external doors provide rapid "purge" ventilation. Openable window sections must have an aggregate area equal to at least 1/20th (5%) of the floor area of the room they serve if they open more than 30 degrees, or 1/10th (10%) if they open between 15 and 30 degrees.

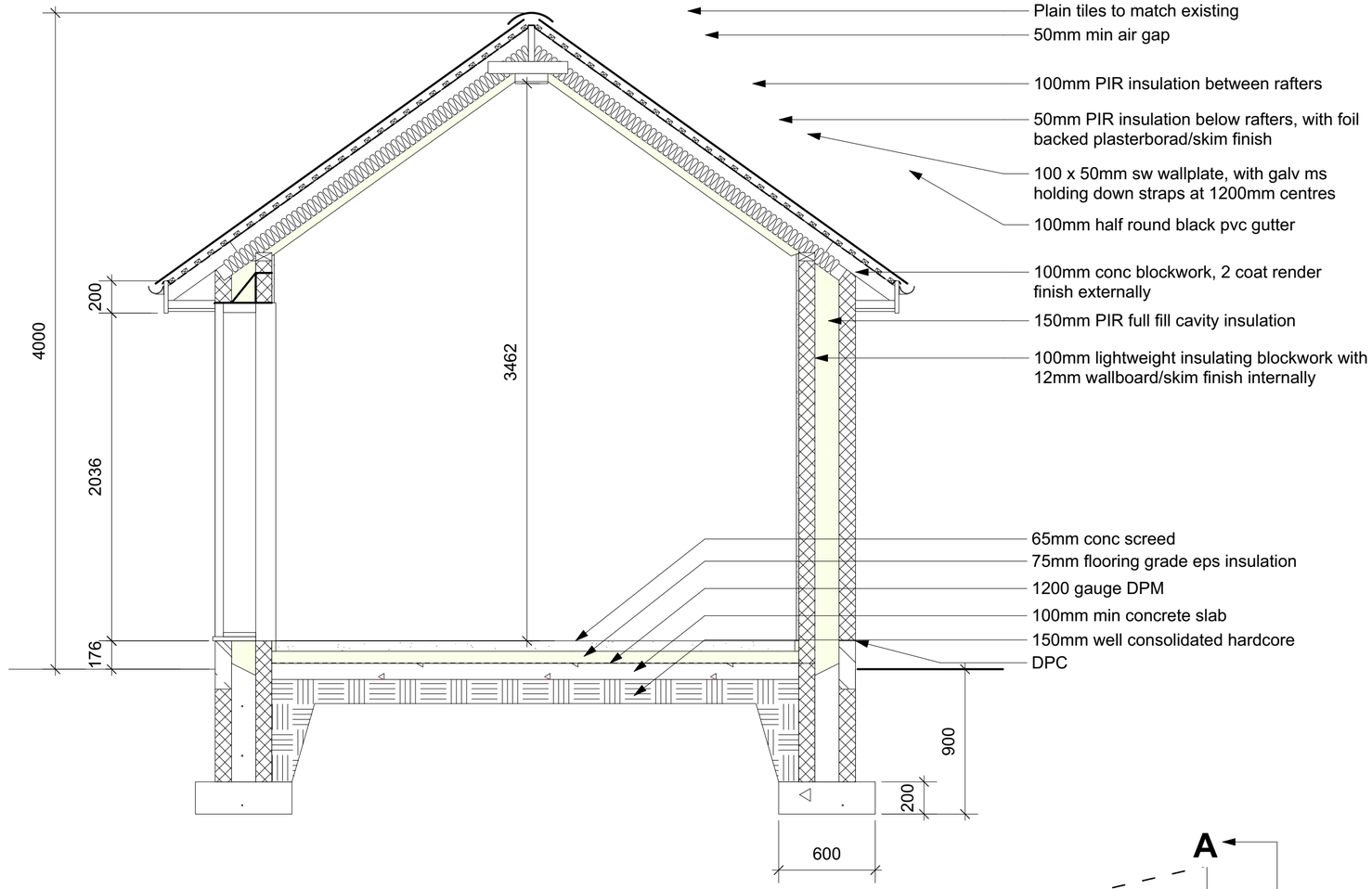
Mechanical Extract Fans (Wet Rooms): If the single-storey extension includes a kitchen, utility room, or bathroom, install mains-powered mechanical extract fans complying with Approved Document F. Minimum extract rates must meet or exceed:

Kitchen (adjacent to hob): 30 litres per second (l/s) intermittent, or 60 l/s if located elsewhere in the room.

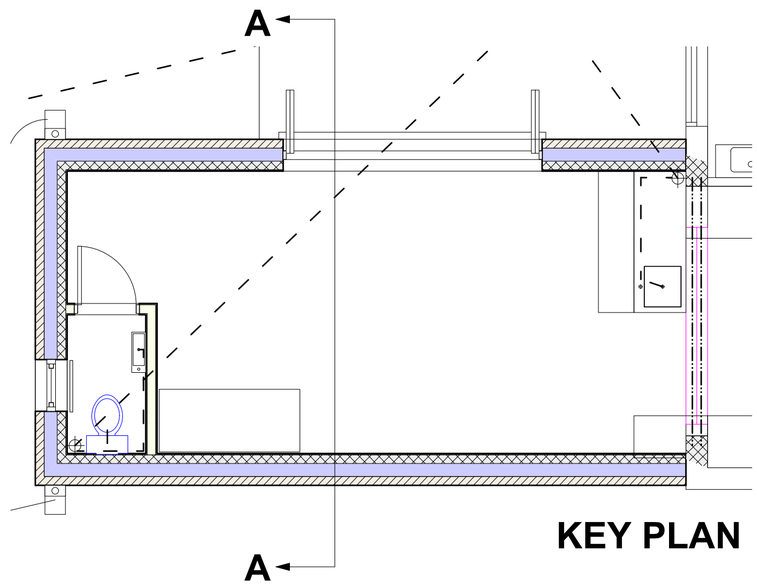
Utility Room: 30 litres per second (l/s) intermittent.

Bathroom / WC: 15 litres per second (l/s) intermittent.

Fan Controls and Ducting: Intermittent extract fans in bathrooms without openable windows must feature a minimum 15-minute overrun timer linked to the light switch. Rigid uPVC ducting must be routed via the shortest possible path through the roof or external walls to a dedicated external grille or roof terminal featuring a back-draught shutter.



SECTION A-A



KEY PLAN

All dimensions to be verified on site, and SBD informed of any discrepancy. All drawings and specifications should be read in conjunction with the Health and Safety Plan; all conflicts should be reported to the Principal Designer. This drawing is the copyright of Sketch Book Design Ltd.

Date	No.	Revision Notes

Date	No.	Issue Notes

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Project Title
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Sheet Title
SECTIONS & SPECIFICATION

Sheet Scale	Sheet Size
1:25 & 1:50	A2
Date	**Drawn By**
June 26	SB
Project No.	**Revision**
J-4010	P1

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J-4010 - SBD - 00 - GF - DR - A - 04

Suitability
D1 SUITABLE FOR TENDER