TECHNOPOL SA
ENERGY SAVING MATERIALS

TECHNICAL DESIGN GUIDE

LiteCore Building System

EPS-core lightweight-concrete block walling for framed buildings · Agrément South Africa certificate 2020/609

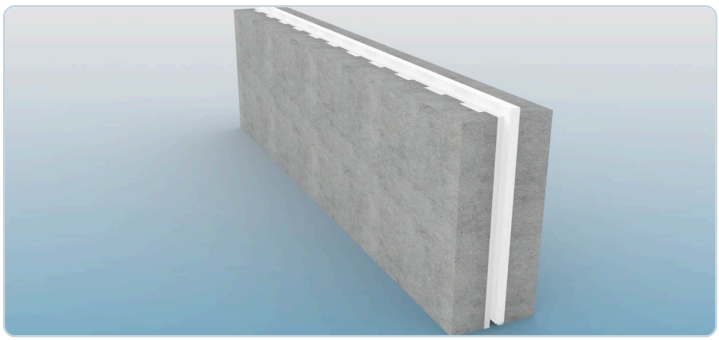
A LiteCore house at wall-plate stage — factory-cast blocks laid in thin-bed stretcher bond within an engineer-designed structure.

This guide covers the design and construction of walls in the **LiteCore Building System** — Technopol's Agrément South Africa-certified walling system (certificate **2020/609**, amended March 2021). Factory-cast lightweight-concrete blocks with a moulded CavityLite EPS core are laid as **non-load-bearing infill** within an engineer-designed structural frame, then mesh-rendered with LiteCore Plast. It sets out the certified block range, wall build-ups, performance values, design rules and the key construction details, each traced to the certificate and its supporting reports.

Single & multi-storey | Non-load-bearing infill | R 2.30 m^2K/W certified | 45 dB between rooms | Thin-bed block laying | All SA regions

1 · The system and how it works

LiteCore blocks are factory-cast from foamed lightweight concrete — Portland cement, fly ash, additives and a synthetic foaming agent with virgin or recycled EPS beads — at a certified density of **400–450 kg/m³**. The external block is a **150 mm composite**: two 45 mm lightweight-concrete skins encapsulating a moulded **60 mm CavityLite EPS core** (15 kg/m³). Internal blocks are 100 mm solid. All blocks are **1200 × 340 mm**, tongue-and-groove interlocking, laid in stretcher bond with LiteCore Bond thin-bed mortar and rendered with LiteCore Plast on woven fibreglass mesh.



Left: the composite block — white EPS core between lightweight-concrete skins, with tongue-and-groove interlock. Right: the wall build-up on site — bare blocks, then mesh-reinforced LiteCore Plast render.

2.30	45 dB	174 mm	1200 × 340
m²K/W certified total wall R-value	DnT,w between rooms (SANS 10218-1)	finished external wall thickness	block face size, mm (all blocks)

Why build with LiteCore

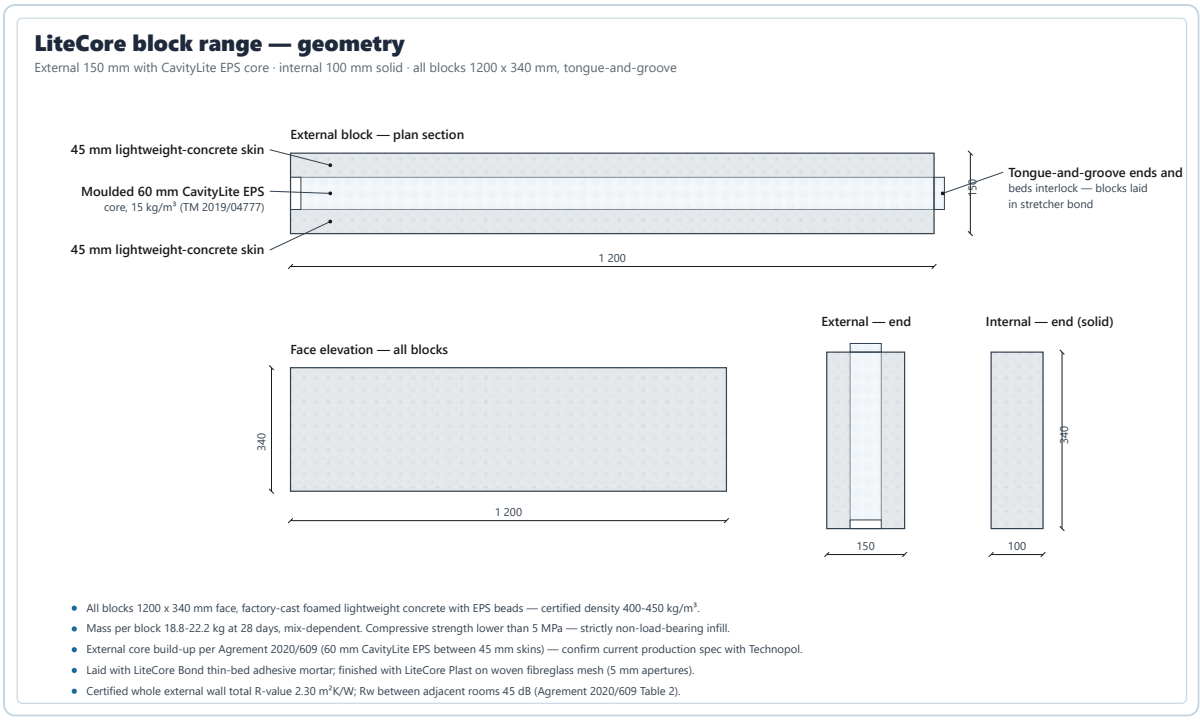
- Large-format 1200 × 340 mm blocks — fast, accurate thin-bed laying with hand tools
- Certified whole-wall thermal resistance of **R 2.30 m²K/W** in a 174 mm wall
- Certified 45 dB (DnT,w) between-room sound insulation
- Certified for a wide SANS 10400 occupancy range, all SA regions
- Conventional services, fixings and a plastered "touch-and-feel" finish
- Compatible with conventional timber or steel roof structures

How the loads are carried

- Blocks are **not load-bearing** — compressive strength below 5 MPa by design
- All vertical and lateral load goes to an **engineer-designed frame**: light steel to SANS 517 or reinforced concrete
- Cast in-situ RC ring beams with columns support the roof
- Wall panels are limited to **3500 mm**; larger panels are a competent person's responsibility
- Multi-storey use is subject to an approved competent engineer taking full responsibility

Certification. Agrément South Africa certificate **2020/609** (amended March 2021) covers the LiteCore Building System for single- and multi-storey **non-load-bearing** walls in all South African regions. The whole system must be designed and erected under the control of a professional engineer or approved competent person (rational design and monitoring). Verify the live certificate status at agrement.co.za before specifying.

2 · Block range & wall build-ups



Certified block geometry — external 150 mm composite section (45 / 60 / 45), 1200 × 340 face, and the 100 mm solid internal block (Agrément 2020/609, Figure 2).

Block range

Block	Face size L × H	Width	Build-up	Certified density	Mass (published)
External block	**1200 × 340 mm**	**150 mm**	45 mm LWC skin + 60 mm CavityLite EPS core (15 kg/m³) + 45 mm LWC skin	400–450 kg/m³	18 kg*
Internal block	1200 × 340 mm	100 mm	Solid lightweight concrete (no EPS core)	400–450 kg/m³	—

*Brochure figure. Measured 28-day masses run 18.8–22.2 kg depending on mix, and measured dry densities (494–597 kg/m³) ran above the certified nominal band in QC tests — confirm declared mass and density with Technopol for structural take-offs. Compressive strength is below 5 MPa by design: the blocks are never load-bearing.

Wall build-ups & finished thicknesses

Wall	Build-up	Finished thickness
External wall (certified section)	12 mm LiteCore Plast + 45 + 60 + 45 mm block + 12 mm LiteCore Plast	**174 mm**
Internal wall 1	100 mm block + 5 mm LiteCore Plast each side	≈ 110 mm
Internal wall 2	100 mm block + 18 mm LiteCore Plast each side	≈ 136 mm

Joints and finish. Blocks are laid in stretcher bond with **LiteCore Bond** thin-bed adhesive mortar at 3 kg/m² (brochure rate); the tongue-and-groove interlock gives faster, more accurate laying, and the mortar cures like normal mortar. All render coats are **LiteCore Plast on woven fibreglass mesh with 5 mm apertures** — external walls minimum 12 mm, internal walls 5 mm (Internal wall 1) or 18 mm (Internal wall 2). For take-offs, the 1200 × 340 face gives ≈ 2.45 blocks per m² of wall — a geometric figure, not a published one; confirm coverage and waste with Technopol.

3 · Certified performance

Thermal & energy

Total wall R-value, external walls (certified)	**2.30 m²K/W** — Agrément 2020/609, Table 2
Energy modelling	BSIMAC v9, 53 m² dwelling — exceeds the performance of a standard brick house per SANS 10400-XA Cl 4.2.1(b)
Ceilings	**Insulated ceilings are mandatory in all instances** (certificate condition)
Condensation	Satisfactory in the Southern Coastal Condensation Problem area, with ceilings installed

Acoustic — Acusolv report G1476 (B G van Zyl PhD, 11 Mar 2021)

Panel	Build-up (as modelled)	Overall	Rw / DnT,w
1 — Internal wall 1	100 mm block (450 kg/m³) + 5 mm plaster both sides	110 mm	**45 dB**
2 — Internal wall 2	100 mm block + 20 mm plaster both sides	140 mm	**47 dB**
3 — Composite wall	150 mm composite + 5 mm plaster both sides	160 mm	**47 dB**
4 — Composite wall	150 mm composite + 15 mm plaster both sides	180 mm	**48 dB**

Certified between-room value: **45 dB (DnT,w)**, meeting SANS 10218-1 (certificate Table 2). The external-wall 30 dB minimum is met by all panels in all occupancy classes, and full third-octave spectra (63 Hz–8 kHz) are available per panel for acoustic designers. Note: the composite panels were *modelled* with a 50 mm core at 32 kg/m³ between 50 mm skins, which differs from the certified production core (60 mm at 15 kg/m³ between 45 mm skins) — confirm with Technopol before relying on composite-wall acoustic figures. Agrément acoustic certification does not cover noise impact on the external environment (National Noise Regulations apply).

Certified occupancy classes (SANS 10400)

The signed certificate lists the following occupancies for LiteCore walling:

A3 Places of instruction · A4 Places of worship · B2 · B3 Commercial · D2 · D3 Industrial · F1 · F2 Shops · F3 Wholesalers' stores · G1 Offices · H2 Dormitories & hostels · H3 Domestic residences · H4 Detached dwellings

Conditional and excluded classes. Places of detention (E1), hospitals (E2) and other institutional occupancies are certified **only when Internal wall 2** (the 18 mm-plaster internal wall) is used between rooms — the build-up that reaches the 47 dB hospital criterion. Hotels (H1) and hospitality (H5) were applied for but are **not** in the granted scope: only Panel 4 reaches the 48 dB hotel criterion and no panel meets the 52 dB theatre criterion — do not imply certification for these uses.

Wet-room finish inside a LiteCore home — wet rooms follow the certified primer, membrane and sealant build-up on page 5.

Internal LiteCore walls under conventional timber roof trusses — the block texture before the internal LiteCore Plast coat.

4 · Design & site considerations

Structure & design rules

- **Non-load-bearing infill only** — every wall sits within a structural frame: light steel frame to **SANS 517** or reinforced concrete (rebar SANS 920; concrete SANS 10100-1/-2)
- Wall dimensional limit **3500 mm**; walls beyond this are the responsibility of a competent person
- Multi-storey use subject to an approved competent engineer taking full responsibility
- Cast in-situ **RC ring beams with columns** support the roof; purpose-designed horizontal braces under trusses where eaves or gable walls need wind support
- Foundations and surface beds conventional (competent person); **DPM to SANS 952** under all surface beds and edge beams
- Roofs: conventional timber or steel trusses with light, heavy or Agrément-approved cladding
- Certificate-holder QMS approved by Agrément (SANS/ISO 9001-based) with post-certification monitoring; an Agrément plaque (min 100 × 75 mm) must be fixed to an external wall of every LiteCore building

Fixing, fastening & services

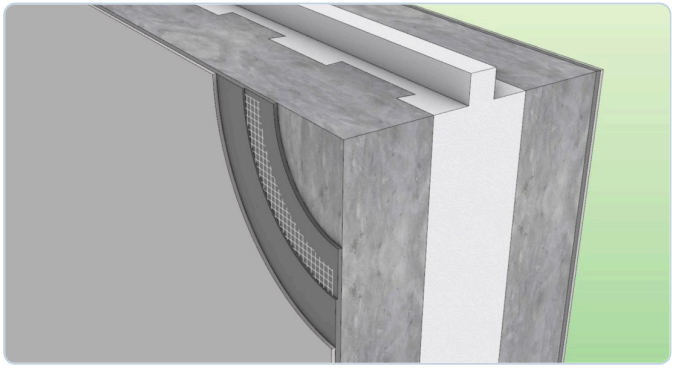
- Wall anchorage: **steel starter brackets (100 mm long × 50 × 151 × 1 mm) at 1200 mm centres**, one M8 × 50 mm rawl bolt per bracket, on bituminous paint over the DPM; brackets anchored into slab, roof and structural mullions
- Light and medium fittings on **spring fischer plugs with 6 mm coach screws**; heavy fittings floor-mounted
- Services conventional — chased or surface-mounted. Chases ≈ 50 mm wide, staggered at least **300 mm** apart, cut to the face of the cementitious material behind the EPS insert and refilled with Styronit STY 160 or similar approved
- Window and door frames conventional or Agrément-approved, built in as work proceeds

Rendering & wet areas

- **Do not plaster a large wall within 14 days** of construction — the blocks show substantial wet-dry shrinkage (≈ 16% average measured moisture loss)
- Never plaster directly over steel or RC elements — bridge with a LiteCel or Rockwool strip and strip mesh lapped 100 mm onto each wall side
- Add an extra mesh layer at areas prone to thermal-stress cracking; use lighter colours on sun-exposed facades
- Wet rooms: two coats Elestocryl primer + two coats approved fungicidal, impermeable paint; shower trays with min 150 mm upstand and a watertight membrane; SANS 1305 silicone sealant at junctions

Behaviour in fire — exactly what is certified. Per Agrément certificate 2020/609 Table 1, external walls of LiteCore buildings are classified **non-combustible (type FRR) with a 120-minute fire-resistance rating** as defined in deemed-to-satisfy rule TT2.1(a) of SANS 10400 Section 3 (DtS rules TT5.1 and TT5.2 met; Regulations K4 and T1(1)(b)/(c) satisfied). This is a **certificate deemed-to-satisfy classification, not an independent SANS 10177-2 furnace test** of the rendered block wall. Currently valid supporting tests: fire-retardant EPS (FRCel 20DV, 60 mm) is classified **B-s1,d0** reaction-to-fire to SANS 53501-1 (report IT 23-08-00009) — a reaction-to-fire class, not a fire-resistance (minutes) rating; and the NuClad LiteCore light-steel-frame wall assembly achieved **FR60 load-bearing (E/I/R 60)** to SANS 10177-2 (report FT 24-003) — an assembly test, not the block wall alone. The EPS core is combustible and thermoplastic: the multi-storey cavity fire-break conditions on page 7 are mandatory. The system may be used for H3 division separation provided a door assembly of similar rating is used.

Render-skin stage — a double-storey build being plastered on scaffolding after the 14-day curing hold.



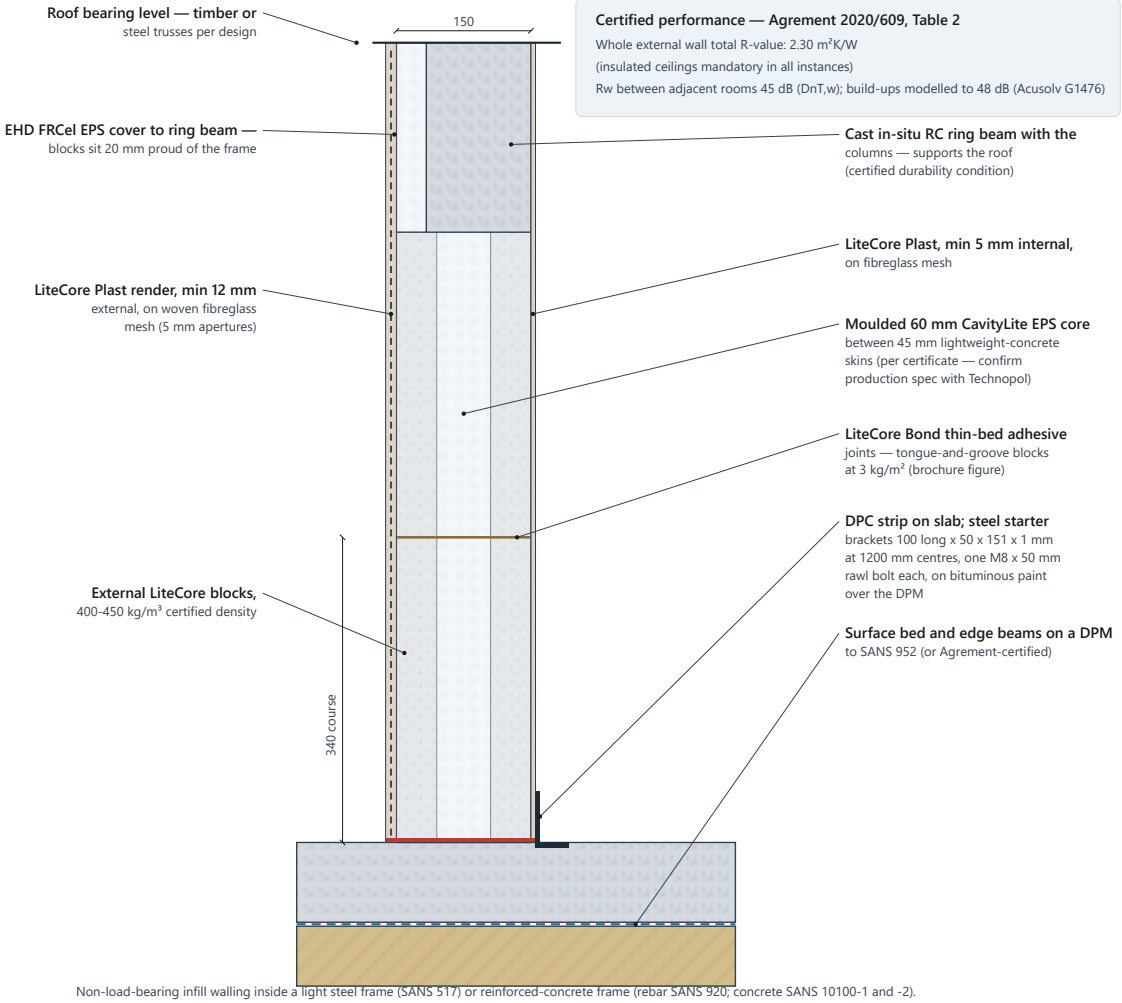
The mesh-reinforced render skin over the blocks — cutaway from the LiteCore plastering guidelines.

5 · Application details

5.1 Certified external wall section

External wall build-up — vertical section

150 mm LiteCore block · 12 mm external / 5 mm internal LiteCore Plast on mesh · DPC, ring beam and FRCel cover



Non-load-bearing infill walling inside a light steel frame (SANS 517) or reinforced-concrete frame (rebar SANS 920; concrete SANS 10100-1 and -2).
Foundations and surface beds by a competent person (SANS 10400 H1). Do not plaster a large wall within 14 days of construction.

Certified external wall — 150 mm composite block on a DPC strip over the surface bed and DPM (SANS 952), 12 mm external and 5 mm internal LiteCore Plast on mesh, RC ring beam covered externally with EHD FRCel EPS (Agrément 2020/609, Figure 1).

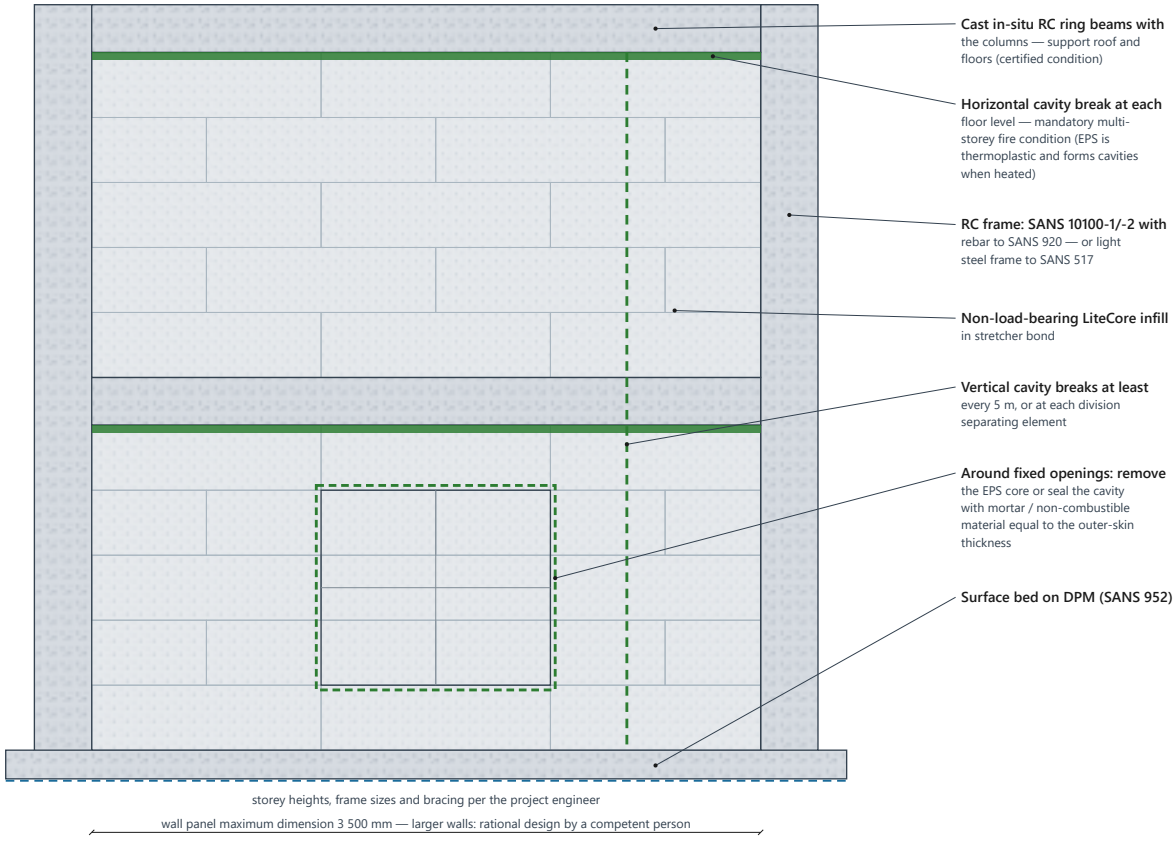
Base anchorage. Steel starter brackets (100 mm long × 50 × 151 × 1 mm) at 1200 mm centres, each with one M8 × 50 mm rawl bolt, are set on bituminous paint over the DPM on the 75 mm concrete surface bed; matching brackets anchor the wall to the slab, roof structure and structural mullions. The finished wall is 174 mm thick and delivers the certified R 2.30 m²K/W and 45 dB between-room performance of page 4.

5 · Application details (cont.)

5.2 Non-load-bearing infill in the structural frame

Non-load-bearing infill in the structural frame

LiteCore panels inside an engineered frame · 3 500 mm panel limit · multi-storey cavity-break fire conditions



LiteCore panels infill an engineer-designed frame — light steel to SANS 517 or reinforced concrete — in stretcher bond, with the 3500 mm panel limit and the mandatory multi-storey cavity fire breaks shown.

Frame rules

- The frame — not the wall — carries all vertical and lateral load; blocks are below 5 MPa by design
- Panels over 3500 mm, and all multi-storey use, are an approved competent engineer's responsibility
- RC ring beams with columns support roofs; horizontal braces under trusses where eaves or gable walls need wind support

Mandatory multi-storey fire conditions (certificate Table 1)

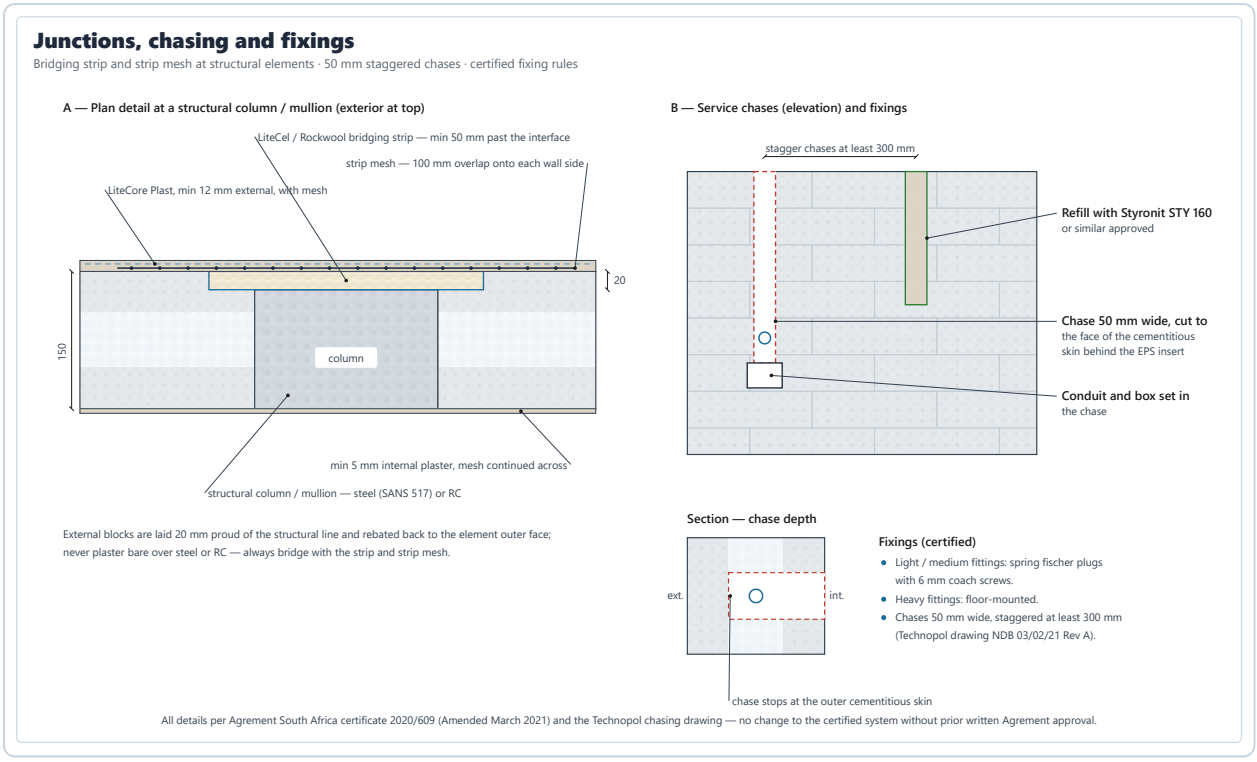
- **Horizontal cavity breaks at each floor level**
- **Vertical breaks at least every 5 m** or at each division separating element
- Around fixed openings: remove the insulation core or seal the cavity with mortar or non-combustible material equal to the outer-skin thickness
- **Back-to-back service installations are not permitted** in any dividing wall

Infill in practice — laying LiteCore blocks off scaffolding beneath a reinforced-concrete slab.

Gable walls and sheeted roof going on — the frame and ring beams carry the roof, LiteCore closes the envelope.

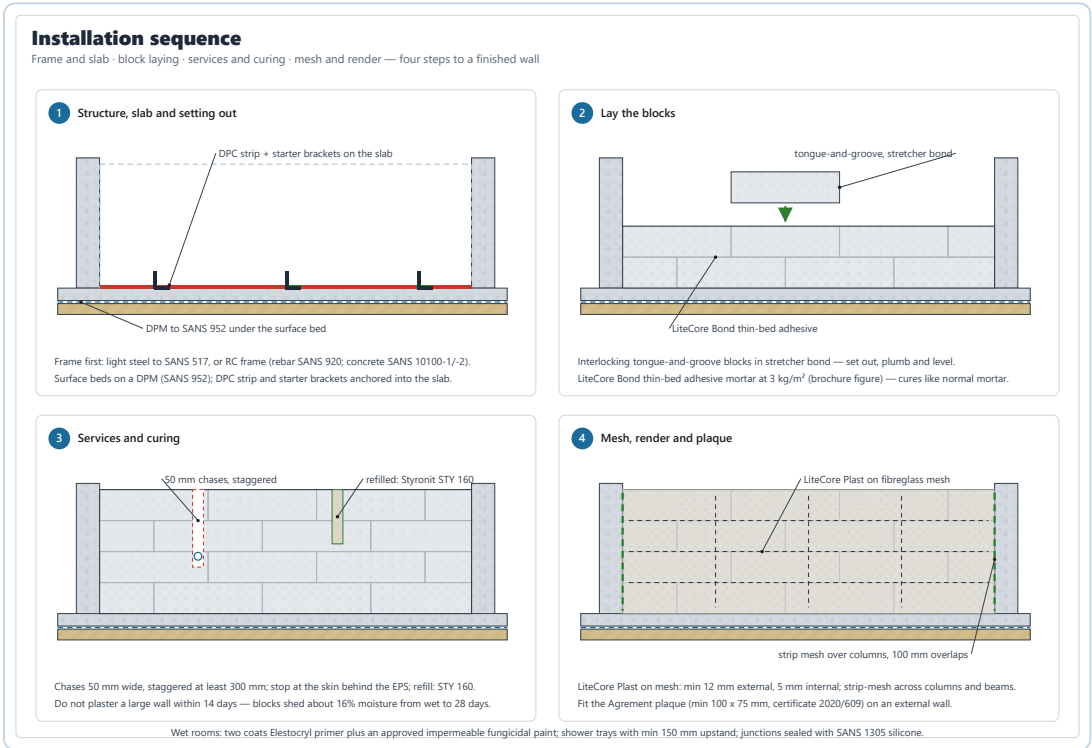
5 · Application details (cont.)

5.3 Junctions, chasing & fixings



Structural-column junction — external blocks laid 20 mm proud of the structural line, LiteCel/Rockwool bridging strip with strip mesh lapped 100 mm each side — and service chases: ≈ 50 mm wide, staggered ≥ 300 mm, refilled with STY 160.

5.4 Site sequence & rendering



Four-step sequence — structure and setting out (DPC + starter brackets), thin-bed block laying at 3 kg/m², services and the 14-day curing hold, then mesh-reinforced LiteCore Plast render and the Agrément plaque.

6 · LiteCore in the field

LiteCore on South African sites — large-format blocks handled with hand tools and minimal labour, laid as infill walling in houses, double-storey builds, commercial steel frames and multi-storey apartment projects, then mesh-rendered to a conventional plastered finish.

Ring beam & block laying — cast in-situ RC ring beams with columns carry the roof; LiteCore blocks infill between.

Wall plate to roof — lightweight steel trusses and roof panels installed over LiteCore walls.

Multi-storey capability — a double-storey LiteCore build, under an approved engineer's responsibility.

Commercial scale — a finished multi-storey apartment facade built with LiteCore walling.

Steel-frame infill — LiteCore partition walling inside a commercial steel-framed building.

The finished result — a conventional plastered, painted interior with standard fixings and finishes.

Specify LiteCore — certificate documentation, block schedules & project support · info@technopol.co.za · (011) 363-2780 · technopol.co.za