

MIRIAN

Concrete Homes

Engineered for Resilience.
Designed for Life.



TECHNICAL CONCEPT REVIEW & DESIGN PORTFOLIO | 2026

MIRIAN PTY LTD • DIRECTOR: ARMAN MIRIAN • NORTH KELLYVILLE NSW • ABN 56 621 406 095

DEEP TECHNICAL REVIEW OF MIRIAN CONCRETE HOMES CONCEPT

Mirian Pty Ltd's Concrete Homes™ concept represents a significant and well-considered evolution in Australian residential construction. Drawing on 15+ years of hands-on formwork and concrete experience — including the Director's own home — the portfolio of concepts (A through H) demonstrates a mature understanding of structural concrete as both a resilient shell and a versatile architectural language. The approach intelligently balances pure concrete minimalism with pragmatic hybrid systems, addressing key Australian challenges: bushfire, flood, termites, thermal extremes, insurance pressures, and lifecycle costs.

Core Strengths

- **Structural Resilience & Durability:** RC frames or perimeter walls deliver excellent performance in fire (non-combustible, high FRL), flood (elevated or sealed options), and termite-prone areas. Thermal mass provides passive temperature stabilisation — critical for NSW's variable climate.
- **Design Versatility:** The eight concepts explore a wide spectrum: pure brutalist/modernist (A, H, G), stepped/sloping-site solutions with external stairs (C, G), hybrid timber-concrete for warmth and cost control (B, D, F), and brick/Hebel integrations (E). This range supports market segmentation from premium custom homes to duplexes and rural resilient pods.
- **Constructability & Speed:** Slab-column or perimeter-wall systems enable efficient staged pours, integrated service conduits, and clean interior cores. No timber warping or plaster cracking issues. Precast adaptability noted for regional projects.
- **Lifecycle Economics:** Higher upfront cost offset by dramatically lower maintenance, superior insurability in high-risk zones, and 100+ year design life. The performance comparison table in the original materials is directionally correct and can be strengthened with quantified data.
- **Smart & Sustainable Foundations:** Solar-ready roof optimisation, EV charging infrastructure, smart conduit pathways, and the innovative dehumidification + water recovery system (capturing condensate for greywater) are forward-thinking and directly address occupant comfort and resource efficiency in humid/coastal NSW.

Constructive Critique & Enhancement Opportunities

- **Thermal Bridging & Detailing:** Cantilevered slabs and exposed concrete elements (visible in Concepts A, C, G, H) require robust thermal breaks or external insulation strategies to meet or exceed NCC 2022 energy provisions and avoid condensation risk. Hybrid concepts (B, D) naturally mitigate some bridging via cladding.
- **Acoustics:** Exposed concrete transmits impact and airborne sound effectively. Recommend specifying acoustic underlays, resilient channels, or decoupled partitions for multi-level homes and duplex party walls.
- **Embodied Carbon:** While operational energy is low thanks to mass and airtightness, upfront CO₂ from concrete is significant. Future iterations should quantify and reduce via SCM-rich mixes (fly ash, GGBFS, calcined clay), optimised section sizes, and hybrid where pure RC is not structurally necessary.
- **Standardisation vs Customisation:** Excellent visual variety exists. To improve repeatability and margin, develop a limited set of standardised column grids, slab modules, and service cores while retaining facade and roof flexibility per concept.
- **Site & Flood Responsiveness:** Concepts with undercroft or external stair elements (C, G, some D/F) are particularly strong for sloping or flood-prone sites. These should be highlighted with specific BAL and flood zone performance data.

Overall Assessment

The Mirian Concrete Homes concept is **technically sound, architecturally compelling, and commercially well-positioned**. It correctly identifies concrete as the material for "stronger futures" in an era of increasing climate and insurance risk. The visual language is consistent and premium. With refined thermal detailing, acoustic strategies, low-carbon concrete specifications, and a clear modular framework, Mirian is ready to move from compelling renders to bankable, insurable, high-performance projects at scale.

TECHNICAL FOUNDATIONS & PERFORMANCE SPECIFICATIONS

Typical Mirian RC Home — Reference Specifications

Element	Specification	Notes / Rationale
Concrete Grade	32,40, or 50 MPa (f'c) as per structural spec.	High durability; Exposure Class B2 per AS 3600 for most NSW sites
Ground Slab	150–180 mm reinforced or post-tensioned	Integrated conduits for services & optional hydronic heating
Upper Floor Slab	180–250mm RC slab on columns/beams	Edge-set or perimeter wall support; clean soffit options
Columns	350×350 mm or 400×400 mm RC	It can be class 1, 2 or 3 form finish; thermal break at cantilevers
Reinforcement	N-grade bars + mesh; 40–60 mm cover typical	Corrosion protection for aggressive soils or coastal
Roof — Flat	Liquid-applied membrane or single-ply on insulation	Solar-ready with optimised pitch/orientation
Roof — Pitched	Colorbond or metal deck on timber/steel	Hybrid concepts; improved drainage & attic space option
External Walls	In-situ concrete or hybrid (Hebel, brick, timber cladding)	Concept-dependent; thermal mass + weather barrier
Windows & Glazing	Thermally broken aluminium, double or triple glazed, low-E	U-value target <1.5 W/m²K; BAL-compliant toughened where required
Insulation Strategy	External or cavity where applicable; thermal breaks at cantilevers	Addresses bridging in exposed concrete designs

Performance Comparison — Structural Systems

Criteria	Timber Frame	Brick Veneer	Cavity Brick	Mirian RC Shell
Durability / Lifespan	Low–Mod (40–70 yrs)	Moderate (60–80 yrs)	Good (80–100+ yrs)	Excellent (100+ yrs)
Fire / Flood Resilience	Low	Moderate	Moderate–High	High (BAL-FZ capable)
Thermal Mass / Comfort	Low	Low–Mod	Moderate	High (passive regulation)
Maintenance	High (painting, termites)	Moderate	Low–Mod	Very Low
Smart / Future-Proof	Poor (retrofit)	Basic	Basic	Built-in (conduits, EV, solar)
Lifecycle Cost	High	High	High	Lowest (longevity + low maint.)

Smart & Sustainable Features (Standard)

- Solar-ready roof geometry and conduit pathways for PV arrays and battery storage (Tesla Powerwall compatible zones).
- EV charging-ready: dedicated circuits and conduit to garage/carport locations from main switchboard.
- Pre-planned smart infrastructure: NBN, CCTV, lighting control, security, and home automation rough-in (Google Home / Alexa / HomeKit ready).
- Climate-optimised HVAC integration: dehumidification with condensate recovery for greywater or garden reuse (where permitted by NSW regulations).
- Superior airtightness and thermal mass to reduce HVAC demand and maximise solar self-consumption.
- Low-VOC materials and finishes; option for low-carbon concrete mixes with SCMs.

FLAGSHIP CONCEPT A — OPEN FRAME CONCRETE SHELL



Concept A — Two-storey open-frame reinforced concrete home with cantilevered upper level, large format glazing, and seamless flat roof integration. Photorealistic architectural visualisation.

Technical Description

Ground Floor: Slab-on-ground with architectural flexibility for infill walls (brick, Hebel, block, or full concrete). Open column grid allows fluid interior planning.

Structure: Edge-set reinforced concrete columns supporting upper slab and flat roof. Clean, minimalist stairwell (concrete) as internal core. No lift shaft required for typical 2–3 storey configurations.

Key Features: Integrated water management (gutters concealed in slab edges), smart conduit & service pathways cast into slabs/columns, fast cost-effective pour staging, column-and-slab simplicity for structural clarity.

Deep Review Notes — Concept A

- **Strengths:** Excellent daylighting and connection to landscape via large openings. Structural honesty and minimalism appeal to premium market. Easy future modification of non-structural infill walls.
- **Engineering Considerations:** Cantilevered upper slab requires careful deflection control and thermal break detailing. Column grid should be rationalised for repetitive formwork (e.g. 6.0 × 7.5 m modules).
- **Best Suited For:** Flat or gently sloping sites, custom family homes, or duplex configurations where open-plan living and strong indoor-outdoor flow are priorities.

- **Enhancement Potential:** Add external insulation or rainscreen on upper level for thermal performance; integrate photovoltaic array on flat roof with minimal visual impact.

FLAGSHIP CONCEPT B & HYBRID VARIATIONS



Concept B — Hybrid concrete and timber-clad residence. Full-height concrete perimeter walls at ground level with upper-level timber cladding for warmth and reduced thermal bridging.

Technical Description — Concept B

Ground Floor: Full-height concrete perimeter walls flush with slab edge — provides solid, secure, fire-resistant base and excellent thermal mass.

Structure: Same slab-column-roof principle as Concept A, with added solid façade options. Windows/doors cast as openings — no extra structural framing required.

Hybrid Advantage: Upper level timber or lightweight cladding reduces weight, improves thermal performance (less bridging), and delivers warmer interior aesthetic preferred by many Australian buyers.

Review Notes — Hybrids (B, D, E, F)

- Hybrid systems intelligently address the main criticisms of pure concrete (thermal bridging, cold aesthetic, higher embodied carbon in some elements).
- Timber cladding on upper levels (as in generated visualisation below) offers excellent opportunity for cost optimisation and faster construction sequencing.
- Brick/Hebel options (Concept E) provide traditional Australian material language while retaining concrete structural advantages at ground and core.
- These variations demonstrate Mirian's pragmatic understanding that not every client wants pure brutalism — flexibility is a commercial strength.



Generated Visualisation — Hybrid concrete base with warm timber upper level and integrated carport. Demonstrates how Mirian concepts can be extended with contemporary Australian material palettes while maintaining structural integrity and clean lines.

DESIGN VARIATIONS PORTFOLIO — CONCEPTS C-H

The following concepts illustrate the breadth of the Mirian design language — from stepped massing for sloping sites to compact pavilion forms and bold cantilevered compositions. Each has been reviewed for structural logic, site responsiveness, and market fit.



Concept C

Stepped massing with external stair access — ideal for sloping sites and flood-prone locations. Strong visual hierarchy and robust concrete language.



Concept D

Pitched roof hybrid with generous carport/undercroft. Excellent for rural or larger lots; combines concrete durability with traditional roof forms.



Concept E

Yellow brick upper level on concrete base. Bridges contemporary and traditional Australian aesthetics while delivering concrete structural performance.



Concept F

Compact pavilion with concrete core and timber wing. Patio-focused indoor-outdoor living; suited to smaller lots or granny-flat / secondary dwelling applications.

***Concept G***

Bold cantilever with external stair and balcony. Dramatic architectural statement; strong for sites requiring separation of living zones or elevated views.

***Concept H***

Crisp white/gray concrete volumes with strong horizontal emphasis. Refined minimalist expression; highly customisable for premium urban or coastal projects.

ADDITIONAL VISUALISATIONS — INTERIOR & EXTENDED CONCEPTS

To further demonstrate the liveability and premium quality of Mirian Concrete Homes, additional photorealistic visualisations have been developed.



Generated Interior Visualisation — Open-plan living, dining and kitchen within a Mirian concrete shell. Exposed board-formed concrete ceiling and walls provide thermal mass and architectural authenticity. Large sliding glass doors connect seamlessly to landscape. Polished concrete floors and minimalist high-end finishes exemplify the clean, durable, light-filled aesthetic achievable with the system.

Key Interior & Detailing Opportunities

- **Exposed Concrete Finishes:** Board-formed or fair-faced concrete can be left as feature walls or ceilings, reducing plasterboard and paint costs while adding character and thermal mass.
- **Acoustic & Comfort Layering:** While structure is concrete, interiors benefit from strategic use of timber screens, rugs, upholstered furniture, and acoustic panels in key zones (living, bedrooms) to balance the hard surfaces.
- **Services Integration:** All electrical, data, and HVAC rough-in is cast into slabs and walls during construction — resulting in clean, uninterrupted surfaces with no visible trunking or bulkheads in most areas.
- **Future Flexibility:** Non-structural partitions and joinery can be reconfigured over the home's life with minimal structural intervention — a major advantage over load-bearing masonry or timber frame systems.

WHAT WE OFFER & NEXT STEPS

Mirian Pty Ltd delivers complete in-situ or hybrid concrete shell construction from slab to roof, backed by real-world experience and a commitment to resilient, sustainable Australian homes.

Our Offering

- Custom single dwellings and duplexes designed around the Concept A–H language or fully bespoke.
- Solid perimeter wall or flexible column-and-slab systems (concrete, brick, Hebel, or hybrid timber).
- Rural, bushfire (BAL-40/FZ), and flood-resilient home designs and pods.
- Scalable concrete frameworks for project builders and developers.
- Full service: design coordination, structural engineering liaison (RFIs), formwork, reinforcement, concrete placement, and finishing.
- All systems engineered to meet or exceed NCC 2022, BASIX, and relevant Australian Standards.

Why Engage Mirian Early

Early involvement allows optimisation of column grids, service routes, thermal detailing, and staging — delivering cost and programme certainty. We bring site knowledge, not just desktop design. Our systems are already smart-home ready before walls go up.

Contact & Next Steps

Director: Arman Mirian
Phone: 0410 927 000
Email: projects@mirian.com.au
Web: mirian.com.au
Location: North Kellyville, NSW

We welcome enquiries for feasibility studies, concept development, RFIs, and full project delivery. Whether you are a homeowner, architect, or developer, Mirian provides the technical foundation for homes that are **Resilient. Sustainable. Australian.**

Building resilient homes. Creating sustainable futures.

MIRIAN
PTY LTD
NORTH KELLYVILLE NSW

Ready
to Build
Stronger?

MIRIAN



0410 927 000



projects@mirian.com.au



mirian.com.au

Building resilient homes.
Creating sustainable futures.

**RESILIENT.
SUSTAINABLE.
AUSTRALIAN.**



**SOLAR
READY**



**SMART
HOME**



**EV
READY**

MIRIAN CONCRETE HOMES™ • ENGINEERED FOR RESILIENCE. DESIGNED FOR LIFE. • mirian.com.au



MIRIAN PTY LTD | ABN 58 621 406 095