By Design

DESIGN SUSTAINABILLITY 2025

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Editor's Note

This Sustainability Edition of By Design reflects a shift in how the built environment is approached. The question is no longer whether sustainability matters, but how fully it is embedded in everyday design decisions. Across this issue, the projects show that strong environmental performance rarely comes from a single system or technology, but from clarity, restraint and making ordinary elements work harder.

Many of the featured homes prioritise renovation, reuse and refinement over replacement. Working with existing buildings, salvaged materials and long-life structures, they treat sustainability not as an added layer, but as a disciplined design ethic grounded in care, performance and continuity.

Passive strategies recur throughout the issue. Courtyards, verandas, greenhouses, voids and carefully considered orientation demonstrate that environmental intelligence often begins with geometry and proportion. These moves simply work, season after season, without reliance on behaviour or maintenance.

Material choices reinforce this long-term mindset. Reclaimed brick, reused timber and durable, low-maintenance finishes are valued for their reduced embodied carbon, longevity and resistance to fashion cycles. Sustainability here is measured in decades, not trends.

The Passivhaus projects extend this thinking technically, showing that high performance can coexist with heritage character, comfort and generosity. Airtightness, insulation and ventilation are tools in service of health and liveability, not ends in themselves.

Together, the work in this edition reflects a maturing design culture: less emphasis on doing more, and greater confidence in doing enough, precisely. Sustainability is no longer a special category. It is simply good design.

By Design Magazine - 2025 No16 (December) • Front Cover: Gregg Barr-Jones - Seaview on Peronne

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High-Altitude Efficiency

How a mountain renovation turns passive design into performance art in the Blue Mountains.

Perched atop the escarpment at Mount Tomah, this home stands as a study in environmental intelligence, a balance of comfort, restraint and technical precision. Once dark and thermally inefficient, the original 30-year-old structure has been reborn through a renovation that prioritises performance over expansion. Designed by Helen Lloyd-Martin of 3D Environment, the project embodies the principle that sustainability begins not with excess, but with understanding: of site, of climate, and of materials.

Designer of this project: Helen Lloyd-Martin

At 1,000 metres above sea level, the Blue Mountains climate is no mild test. The site endures frost, fog, snow and summer extremes, all while sitting within a BAL-29 bushfire zone. Every element of the redesign had to serve dual purposes: to protect and to perform. The team began with strategic restraint, retaining the existing Hebel structure for its inherent thermal mass while re-skinning it in local stone and Colorbond Monument Matt to improve fire resistance and long-term durability.

Double-glazed steel-framed windows wrap each elevation, precisely oriented to capture low winter sun while shielding the interior from summer glare. Skylights on all roof planes, integrated with a timber-lined cathedral ceiling, create a passive stack effect for convective ventilation, pulling warm air upward and releasing it through high-level openings. With this natural system in play, no air-conditioning was installed; instead, warmth is drawn from the under-slab hydronic heating, powered by a 30 kW solar array with multiple battery stores.

The thermal envelope became the project's quiet powerhouse.

Double-glazed steel-framed windows wrap each elevation, precisely oriented to capture low winter sun.

Every material choice furthers this logic of performance. Low-VOC finishes protect air quality, while the terrazzo and stone flooring absorb and slowly release heat from the northern light. FSC-certified spotted gum linings add acoustic and thermal benefits, enriching the interiors with warmth and calm. Even the smallest details, from lever handles for accessibility to modular Colorbond sheets sized to reduce waste, express a holistic design ethic that sees sustainability as a system, not a style.

Externally, the home sits quietly in its mountain garden, its dark steel cladding allowing the form to recede into the landscape. Inside, a suspended fireplace anchors the living space, not a gesture of excess, but a symbol of human comfort in balance with nature. The result is a home that maintains steady temperatures, circulates fresh air, and performs beautifully under climatic stress, all while meeting bushfire compliance and creating visual serenity.

Mt Tomah proves that thermal intelligence need not be complex. It lies in aligning architecture with climate, in designing for longevity and calm. In a world chasing net-zero, this mountain home reminds us that sometimes the smartest buildings are the ones that breathe.

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A Greenhouse That Works

How a seasonal garden room became a passive thermal engine for this heritage home In the reimagining of Greenhouse Grove, one detail stands out for its quiet but powerful environmental intelligence: the decision to treat the greenhouse as a performative thermal buffer.

While the project includes many sustainable moves, this single element influences comfort, energy use and daily rhythms in ways far greater than its footprint suggests.

At first glance, the greenhouse appears to be a liminal garden room, a place to grow food, house the family dog and enjoy sheltered views of the sky throughout the year. In reality, it operates as an interstitial climate layer positioned outside the home's thermal envelope. It absorbs, tempers and redistributes heat before it ever reaches the interior. During winter it gathers warmth and slows heat loss from the living areas. During summer it becomes a shaded and insect protected space that supports passive night purging through operable roof lights.

Designer of this project: Talina Edwards

Architecturally, the greenhouse becomes a simple but highly effective energy device. Slate flooring provides thermal mass that smooths temperature swings.

Adjustable shading manages solar exposure. Louvres and operable roof lights direct cross ventilation. None of these measures rely on mechanical systems, yet together they significantly reduce the load placed on the home's active heating and cooling. The strategy is elegantly straightforward: allow the climate to work with the building.

This detail is particularly powerful because it responds to the heritage constraints rather than resisting them.

The site offers limited access to northern light and the design team retained the existing footprint to avoid generating additional embodied carbon.

The site offers limited access to northern light and the design team retained the existing footprint to avoid generating additional embodied carbon. These constraints could have compromised comfort, but the greenhouse becomes the spatial and environmental tool that resolves them. It delivers moderated temperatures, winter sun and improved air movement even when traditional passive solar arrangements were not available.

It also broadens the meaning of environmental performance. The greenhouse encourages everyday rituals such as tending plants and moving through a space that celebrates seasonal change. In this way it binds wellbeing and sustainability into a single experience. It supports ecological richness while also strengthening the emotional connection between the occupants and their home.

As a single design detail, the greenhouse does something rare. It enhances efficiency while nurturing a calmer, more grounded way of living. It becomes both an environmental system and a daily companion that supports resilience, comfort and delight.

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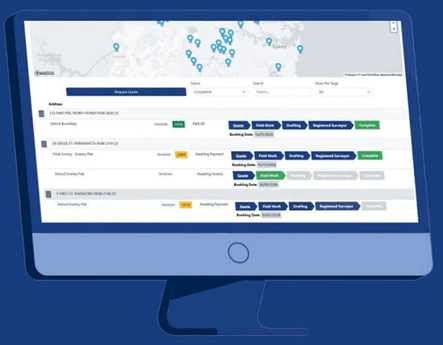

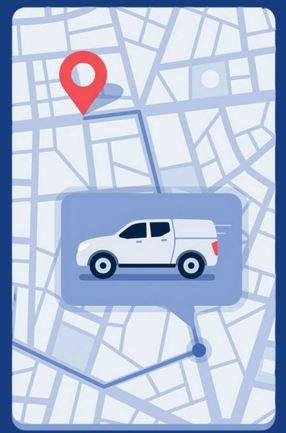

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Surveying that elevates your

Passivhaus Through Retrofit

Designer of this project: Talina Edwards

A deep energy retrofit that proves comfort, heritage and Passivhaus performance can coexist.

For many households the idea of transforming an ageing, thermally unpredictable home into an ultra-efficient sanctuary feels out of reach. The Hillary project shows that it is not only possible but deeply rewarding. What began as a request for a knock-down rebuild became a lesson in the value of retaining the right bones and reimagining them through a rigorous performance lens. The result is a certified Passivhaus Classic home that feels both familiar and completely renewed.

The clients had raised their family in this Art Deco home and loved its character, yet decades of discomfort had worn them down. A renovation in the early 2000s had introduced new frustrations without solving the old ones. The architectural team from Envirotecture approached the brief with fresh eyes, mapping an ideal future floor plan over the existing footprint. To their surprise the two aligned almost perfectly. What followed was a sensitive reframing of the project's value: instead of erasing the past, they proposed building upon it. If the renovation could match the cost of a new build while exceeding it in performance, heritage and comfort, it was worth pursuing. The clients agreed. What makes this project so compelling is the depth of technical commitment underpinning its quiet restraint.

The entire home is wrapped in an airtight envelope equipped with Passivhaus-certified windows, quality insulation and meticulously managed thermal bridging.

Mechanical ventilation with heat recovery ensures a continual supply of filtered fresh air at stable temperatures. As a result, the home maintains an indoor climate of approximately 20 to 25 degrees Celsius year round with only around 12 kWh per day of energy required for heating and cooling in this two-storey dwelling.

The retrofit approach also demonstrates a remarkable circular mindset. The existing structure was retained, significantly reducing material use and embodied carbon. Hardwood flooring from the previous extension was salvaged and reused. Weathertex cladding, made locally from timber waste, gives the new extension both tactility and material integrity. The design integrates shading calibrated by energy modelling to resist summer overheating in this warm temperate climate.

Yet the most striking achievement may be the way performance and atmosphere are made inseparable. Generous glazing frames the rear garden, strengthening an emotional continuity between old and new. The previously cramped kitchen has been reconceived as a sunlit, spacious hub connected to outdoor living. Upstairs, the reconfigured primary suite offers daily rituals of comfort rather than compromise. The project feels neither like a heritage restoration nor a contemporary rebuild but a thoughtful weaving of both.

With a PV system capable of 18.5 kWp, 27 kWh of battery storage and an all-electric specification powering both the home and two electric vehicles, the house now operates almost entirely without grid imports. It is an Energy Future wrapped inside a familiar form.

The Hillary Passive House is not simply a technical success story. It is a cultural one. It demonstrates that long-loved homes do not need to be demolished in order to meet evolving standards of comfort, health and sustainability.

With careful modelling, disciplined detailing and a respect for what already exists, the most meaningful form of progress can emerge from what is already there.

Where the Earth Helps

Borrowed Ground: How a Partially Recessed Slab Delivers Quiet Thermal Stability

By lowering the bedroom floor into the site, this small dwelling uses the earth itself as a passive thermal moderator reducing energy demand without adding systems or complexity.

In compact residential projects, sustainability often hinges on restraint rather than addition. At Cabin'N Zen, one of the most effective environmental moves is also one of the least visible: a concrete slab that is partially recessed into the ground beneath the northern bedrooms .

Rather than treating the site's 1.5–1.7 metre fall as a constraint, the design leverages it to embed the sleeping spaces approximately 600 millimetres below natural ground level. This single decision introduces a powerful passive benefit thermal stability by placing part of the building envelope in direct relationship with the earth.

Designer of this project: Stephen Zang

In warm temperate climates like Peakhurst, ground temperatures fluctuate far less than ambient air. By “borrowing” this stable thermal mass, the recessed slab moderates indoor temperatures year-round: absorbing heat during warmer periods and retaining warmth through winter nights. The result is bedrooms that remain noticeably cooler in summer and more temperate in winter, without mechanical heating or cooling systems .

Crucially, this is not thermal mass applied indiscriminately. The slab is exposed within the insulated envelope and paired with careful solar access. High-level northern windows allow winter sunlight to penetrate deep enough to gently warm the concrete, while the surrounding soil buffers against overnight heat loss. This balance avoids the common pitfall of over-massing, where heavy materials become sluggish or uncomfortable in shoulder seasons.

There is also a spatial dividend. Lowering the bedroom floors increases perceived ceiling height without increasing overall building volume, subtly improving comfort while keeping material use efficient. Externally, the reduced wall height helps the dwelling sit more quietly in the landscape an architectural outcome aligned with both privacy and environmental moderation.

What makes this detail compelling is its economy. No additional materials, no complex detailing, no reliance on user behaviour just a calibrated relationship between building and ground. In a project of only 60 square metres, the recessed slab demonstrates how passive design intelligence, applied with precision, can outperform far more conspicuous sustainability gestures.

Rammed Limestone as Thermal Mass

A material typically treated as decorative becomes a climate instrument shaped from quarry waste.

Most thermal mass stories focus on concrete slabs and masonry blocks, but in the Catalina Sustainable Home, one wall quietly reframes what thermal mass can be. The rammed limestone wall in the main living spaces, visible in several of the interior photographs and described in the brief, is made from locally sourced quarry waste and performs as one of the home's primary energy moderators. It is a sustainability move with both cultural and climatic intelligence.

Designer of this project: Griff Morris

Rammed limestone carries the same thermal advantages as traditional rammed earth, but with a dramatically reduced raw material footprint.

According to the materials section of the submission, the limestone is sourced directly from local quarry offcuts, avoiding the carbon cost associated with imported aggregates and reducing on-site waste streams. Its thermal performance is functional rather than symbolic: it absorbs winter sun where the dining area is oriented to the north, capturing warmth during the day and releasing it slowly as temperatures fall. In summer, when shaded, the mass stays cool and stabilises the indoor environment without mechanical intervention.

The wall's placement is deliberate. It sits within the insulated envelope, exactly where solar energy can strike in winter and where shading systems protect it in summer.

The brief's energy section explains how this heat absorption and release cycle is a cornerstone of the project's constant internal temperature strategy. The material becomes an environmental device, not a decorative feature.

Its sustainability story is equally social. Limestone has a long architectural lineage in Western Australia, and by using quarry waste rather than virgin cut stone, the project connects local identity with contemporary environmental performance. It models a scalable pathway for suburban homes: a material that is affordable, familiar and low-carbon, yet capable of delivering measurable thermal benefits.

While the house includes many advanced systems and technologies, the rammed limestone wall demonstrates something more fundamental. Sustainability does not always require new materials or complex tools. Sometimes it begins with rethinking what already exists in abundance, and giving it a role that serves people, climate and place.

Timber Truss Reuse

Instead of demolishing and replacing, Keperra Cottage turns an existing shed's timber trusses into the primary structural gesture locking embodied energy, memory, and adaptability into the frame.

Designer of this project: Davo Pauli

One of the most quietly radical sustainability moves in Keperra Cottage is not visible at first glance. It sits above head height, spanning the living space: a series of timber trusses salvaged from an existing double-bay shed and reborn as portal frames .

The shed once home to a soundproof music room was well within its serviceable lifespan. Rather than defaulting to demolition, the project treats the structure as a material bank. The original timber trusses were carefully dismantled, then bolted together in groups of three to form robust portal frames capable of carrying new roof loads. This move alone avoided the energy, cost, and waste associated with fabricating new structural elements.

What makes this detail compelling is not just reuse, but upgrade through design intelligence. By grouping the trusses, the designer increased structural capacity without introducing new primary materials. The bolted connections allow the frames to remain legible, demountable, and potentially reusable again an approach aligned with long-life, low-regret construction rather than single-use building systems.

The original timber trusses were carefully dismantled, then bolted together in groups of three to form robust portal frames capable of carrying new roof loads.

In embodied carbon terms, structural timber already carries a lower footprint than steel or concrete. Reusing it amplifies this advantage: the carbon cost of harvesting, processing, and transport has already been “paid.” Keeping the material in circulation extends its value across multiple building lives, a principle often discussed in theory but rarely executed so directly in small residential work.

There is also a spatial dividend. Internally, the portal frames remain exposed, giving the compact dwelling a sense of rhythm and scale. The structure does more than hold the building up it shapes experience. This honesty avoids additional linings or finishes, further reducing material layers while reinforcing a tactile, workshop-derived aesthetic that reflects the project’s design-and-construct ethos.

Importantly, the decision to reuse the trusses was not nostalgic. It was pragmatic. Restricted site access meant all materials had to be carried by hand up a steep slope, making reuse not just environmentally responsible but logistically efficient . Sustainability here emerges from constraint, craft, and familiarity with how things are actually built.

In an era where “low carbon” is often equated with new proprietary products, Keperra Cottage offers a quieter lesson: sometimes the most sustainable detail is already standing on site, waiting to be reimagined.

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Designer of this project: Alejandro Urena Sandoval

Where Brick Does the Work

How one material detail grounds a dual-occupancy home in both performance and place.

In Carters Lane, sustainability is not expressed through high-tech systems or oversized gestures. Instead, one of its most effective environmental moves appears in plain sight: the extensive use of recycled brick across the ground level, including the front porch, internal feature walls, and the outdoor living interface.

On page 2 of the design solution, the brickwork is described as a continuous surface flowing from the entry corridor into the living areas and out to the covered outdoor space. This continuity is more than an aesthetic choice. Recycled brick brings embodied carbon benefits by avoiding the emissions associated with manufacturing new masonry.

Each brick used here represents both material saved from landfill and energy not spent on new production.

Its sustainability role is also thermal. The project is located in Towradgi's warm temperate climate, where diurnal swings make moderate thermal mass beneficial when placed within the insulated envelope. The exposed brick wall inside the living area acts as a stabiliser, absorbing heat during warm periods and releasing it as temperatures cool. The submission's passive design section confirms that thermal mass has been intentionally provided and left uncovered for performance.

But the brickwork also contributes a subtler form of sustainability: cultural and spatial longevity. Reclaimed material carries inherent irregularity and patina, giving the interiors a tactile depth that resists trends. This longevity reduces the likelihood of future replacement or renovation, extending the lifecycle of the finishes and reducing future resource use.

Sustainability here is not expressed in a single technological device but through a material with history, mass and character.

By placing recycled brick at the heart of circulation, entry and social spaces, the project ensures this low-carbon element delivers value from the moment you step inside.

Natural Ventilation Enabled

In the Avalon Beach Wave House, a targeted shift from fixed glazing to operable windows becomes a quiet but powerful sustainability upgrade, transforming how the house cools itself.

Designer of this project: Peter Downes

In the Avalon Beach Wave House, a targeted shift from fixed glazing to operable windows becomes a quiet but powerful sustainability upgrade, transforming how the house cools itself.

One of the most consequential sustainable details in the Avalon Beach Wave House is deceptively simple: the replacement of several fixed windows with operable glazing to enable genuine cross flow ventilation . This adjustment does not alter the home's iconic form or dramatic relationship to the ocean, yet it fundamentally changes how the house performs day to day.

The original design relied heavily on expansive fixed glass, particularly along the east facing elevations. While visually striking, this configuration trapped heat and limited air movement, increasing reliance on mechanical cooling in a warm temperate coastal climate. Rather than reducing glazing or compromising views, the renovation selectively introduces openable windows in key locations across the middle and mezzanine levels.

These operable elements are carefully positioned to work with prevailing coastal breezes.

When opened in sequence, they create pressure differentials that draw cooler air through living spaces and exhaust warmer air upward and outward.

This restores a basic but often overlooked passive principle: ventilation as a primary cooling strategy rather than a secondary one.

Improved cross ventilation reduces the need for air conditioning during mild and moderate conditions, lowering operational energy demand without adding new systems or technologies.

It also increases the effectiveness of the home's commercial grade system when it is used, allowing shorter run times and greater reliance on natural cooling modes .

There is also a comfort dividend. Operable windows allow occupants to fine tune their environment in response to daily and seasonal changes. Morning air can be flushed through the house, humidity released in the afternoon, and evening temperatures moderated naturally. This adaptability is particularly valuable in a coastal setting where conditions can shift rapidly over the course of a day.

Importantly, this intervention respects the architectural integrity of the original wave like form. The change is not about adding more openings, but about making existing ones work harder. By converting static glass into responsive building elements, the house becomes more attuned to its environment rather than sealed off from it.

From a sustainability perspective, this detail exemplifies low impact thinking. No additional materials of significance are required, no new energy systems installed. Instead, performance is unlocked by re engaging with fundamental climatic logic. It is a reminder that meaningful environmental improvement often comes not from doing more, but from allowing a building to behave more like a building again.

In the Avalon Beach Wave House, operable windows are not a minor technical upgrade. They are a recalibration of the relationship between architecture, climate, and comfort, achieved through a single, precise design move.

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Designer of this project: Adam Hobill

Low-Carbon Brick Wall

A small architectural gesture that turns demolition waste into climate performance and privacy.

In Bach 15, one of the most meaningful sustainability decisions is also among the most modest: the courtyard wall built from reclaimed bricks salvaged directly from the site. Noted in the materials section as “reclaimed bricks from site” (page 6), this detail becomes a quiet act of circular construction, where the project’s past is literally rebuilt into its present.

Unlike recycled bricks purchased from a yard, these bricks carry a hyper-local footprint. No transport, no reprocessing, no firing energy. Their embodied carbon is effectively frozen in time, and their reuse prevents tonnes of masonry from entering landfill. The wall stands as a carbon-neutral material decision in a world where masonry is typically associated with high emissions.

Its placement amplifies its impact. The reclaimed brick wall creates a series of angled courtyard enclosures that deliver privacy, act as compliant pool barriers, and provide thermal mass appropriate to a cool temperate climate. The masonry absorbs winter sun and shelters the courtyard microclimate from cold winds, extending the usability of outdoor spaces across more months of the year.

This kind of microclimate work often goes unnoticed, yet it significantly influences comfort and passive performance.

The wall also offers long-term sustainability through longevity.

Bricks with heritage patina age gracefully, reducing the temptation to update or replace them as trends shift. A surface already weathered becomes resistant to fashion cycles, making it one of the most durable and lowest-impact materials in the project.

What makes the decision elegant is its scale. This is not a large sustainability feature, nor an expensive one. It is a designer choosing to work with what exists, to reinterpret waste not as limitation but as opportunity. The reclaimed brick wall becomes a quiet anchor in the landscape, proving that sustainability lives not only in high-tech systems but in the humble act of reusing what would otherwise be discarded.

Letting the Sun In

A compact site uses a single carved void to deliver passive comfort and reduce energy demand.

On a tightly constrained block in Malabar, one of the most effective sustainability features is not a material or a piece of technology but a spatial incision: the north-facing central courtyard. Noted in the design solution as the organising element that “brought light into spaces, creating a sense of openness in the design” (page 2), this courtyard is a passive performance device disguised as an amenity space.

Its sustainability impact begins with daylight. By carving light deep into the plan, the courtyard allows all primary living spaces to receive usable northern daylight throughout the day. In a warm temperate climate, this reduces reliance on artificial lighting, particularly in the transitional hours when energy use typically spikes. The courtyard becomes a natural illuminator, distributing bounce light into rooms that would otherwise be overshadowed by neighbouring boundaries.

Ventilation is the second, equally important function. The courtyard establishes a single-depth condition to adjacent rooms, enabling effective east–west cross-ventilation as confirmed in the ventilation notes (page 5). Operable louvres and opposing window openings allow air to travel through the heart of the home rather than skimming along its edges. As a result, cooling loads are reduced, and comfort is maintained without constant mechanical intervention.

Designer of this project: Jake French

The third layer of sustainability lies in thermal regulation. A courtyard introduces a microclimate that conditions incoming air before it enters the home. Shaded planting, water from the pool nearby, and the courtyard's proportions create areas of cooler air that feed the cross-ventilation pathways.

This simple spatial move increases the effectiveness of natural cooling even on days where breezes are mild.

While the project includes solar, heat pumps, and efficient systems, the courtyard stands apart as a long-term, zero-maintenance sustainability feature. It cannot break, it requires no servicing, and it performs better with age as landscape elements mature.

At its core, the north-facing courtyard is a reminder that environmental performance is often achieved not through complexity but through the courage to remove built volume. A single void unlocks daylight, air movement, and psychological spaciousness in a compact home—proving that subtraction can be the most sustainable design act of all.

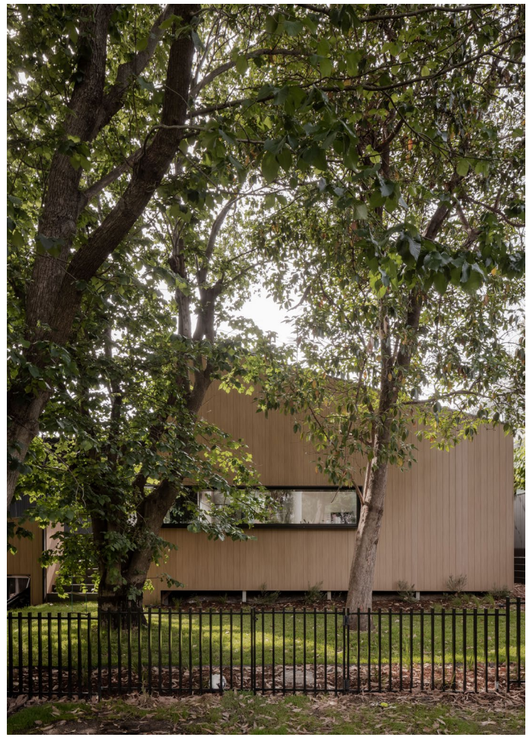
Designer of this project: Sky Tiong

A Facade for the Long Term

A timber like facade that removes ongoing coatings, reduces material cycles, and stays recyclable.

One of the most effective sustainable decisions in Eaglemont Modern House is also one of its quietest. The use of Knotwood aluminium timber cladding replaces traditional exterior timber with a material that performs more efficiently over the entire life of the building. It appears throughout the facade and is noted in the materials section for its durability and minimal upkeep.

By selecting a material that never requires refinishing, never leaches chemicals and can be recycled fully, the design turns the facade into a long term environmental decision rather than a short term stylistic one.



Knotwood provides the warmth and visual softness of natural timber, yet avoids the ongoing cycles of sanding, repainting and resealing that real timber demands.

These maintenance cycles require chemicals, labour and repeated resource inputs. By choosing a finish that remains stable without recoating, the design prevents decades of material use that would otherwise be required to keep the facade weather resistant and visually consistent.

This cladding also supports sustainable practice through longevity. Aluminium does not swell, rot or discolour in the way natural timber can in a mild temperate climate. Its colour fastness reduces the need for replacement, and its robustness ensures that the building envelope remains high performing without intervention.

The submission confirms that Knotwood is fully recyclable at end of life. This means the facade can enter an established recycling stream rather than becoming landfill. Over time, this recyclability helps close the loop on material use and supports circular construction.

The architectural photographs in the submission show how the cladding sits comfortably within the tree canopy and responds to light in a warm, organic way. It provides a calm, consistent aesthetic that ages gracefully without maintenance. This demonstrates that sustainable materials do not need to read as alternative. They can support architectural clarity while reducing impact.

By selecting a material that never requires refinishing, never leaches chemicals and can be recycled fully, the design turns the facade into a long term environmental decision rather than a short term stylistic one.

Shade, All the Way Around

A traditional rural detail becomes the primary device for solar control and long term comfort.

Designer of this project: Jason Harb

Among the many decisions shaping Far Meadow, one stands out for the quiet strength of its environmental performance. The full wrap around veranda, noted clearly in the design brief and described again in the design solution as a feature that provides solar protection and enhances thermal comfort (pages 2 and 3), is the most effective passive element in the home.

The veranda creates a continuous shade line around the entire building. In a warm temperate climate, this soft perimeter of shade is far more than a stylistic gesture. It prevents high angle summer sun from striking the walls and glazing, which reduces internal heat gain before it occurs. Unlike fixed awnings that protect only single elevations, the veranda forms an unbroken buffer so that every facade benefits from shade during the hottest part of the day.

The detail works equally well in winter. Because the northeastern living spaces are designed to capture morning light, the veranda allows low angle winter sun to reach deep into the interior while still moderating glare. This combination helps stabilise temperature swings through passive solar gain without overheating the rooms.

The veranda forms an unbroken buffer so that every facade benefits from shade during the hottest part of the day.

It also performs an environmental role that is often overlooked in residential design. By shielding the walls from direct weather, the veranda prolongs the life of external materials. Rain, UV and wind driven moisture do far less damage when the building is wrapped in a deep protective edge. This slows the rate of maintenance and replacement cycles, which directly reduces future material consumption.

The veranda amplifies ventilation as well. French doors and double hung windows that open directly onto this shaded edge can draw cooler air into the home, since the outdoor air beneath the veranda remains several degrees lower than exposed areas. This supports the strong natural ventilation strategy described in the ventilation section (page 6) and reduces the need for mechanical cooling.

What makes this detail powerful is its simplicity. A single architectural move provides shading, weather protection, ventilation potential and material longevity. The veranda transforms the building edge into a continuous passive system that works all year with no mechanical assistance.

This is sustainability achieved through tradition rather than technology. A familiar rural element becomes the home's most effective environmental tool.

Letting Light Travel

A single vertical opening reduces daytime lighting demand and stabilises internal comfort.

In Horizon Haus, one of the most environmentally effective details is also one of the most atmospheric. The double height void in the central living space, described in the brief as a feature that allows the lounge to capture northern light through a large two storey opening (page 4), is not only a spatial gesture. It is a passive performance device that shapes light quality, air movement and energy use from morning to afternoon.

The void works first as a daylight engine. By drawing northern sun deep into the plan, it delivers consistent natural light across the ground floor without relying on artificial lighting for most of the day. In a warm temperate climate, this matters. Wide single level rooms often lose usable daylight by midday, especially when shaded by upper floors. The void removes that limitation by creating a vertical shaft that collects sky light even when the sun angle is low.

Designer of this project: Jake French

Its height also improves heat distribution. Warm air rises naturally into the void, relieving heat from the occupied zone and allowing cooler air to replace it from shaded openings. This complements the cross ventilation strategy noted in the ventilation section, where breezes enter through the entry louvre sidelight, the media room and the western and northern openings in the living area.

The void gives that moving air a path upward, which increases the effectiveness of passive cooling.

The detail contributes a third sustainability benefit that is often overlooked. Because the void brings so much daylight into the centre of the home, rooms positioned deeper in the plan can remain open and connected without becoming energy intensive. A building that depends on constant internal lighting is a building that accumulates hidden operational cost. Here, the void reduces that dependence at the scale of the whole ground floor.

What makes this feature compelling is that it achieves environmental performance without adding systems, equipment or maintenance needs. It is simply the act of making space in the right place. The void becomes a quiet regulator of comfort, light and airflow, working from sunrise to sunset with no energy input.

This is sustainability done through geometry. A single opening transforms the daily experience of the home while lowering its long term operational demand.

Designer of this project: Stuart Osman

A Circle of Daylight

A single opening in an off form concrete roof becomes a natural lighting system with lasting environmental value.

In Monday, the most environmentally meaningful detail is the circular skylight carved into the off form concrete roof. Mentioned in the design solution as a stand out feature of the living area (page 2), this opening performs far beyond aesthetics. It acts as a passive light well that reduces energy use and transforms the quality of the interior environment.

The skylight brings controlled daylight directly into the centre of the home. Because the opening is circular and positioned within a thick concrete roof, the shaft softens the light as it enters. Harsh overhead sun is filtered into a gentle wash that illuminates the space throughout the day. This reduces the need for artificial lighting for many hours, especially in morning and midday periods when interior rooms typically require supplemental light.

The circular shape contributes to its environmental performance. It creates even light dispersion without casting strong directional shadows, which means a wider footprint of usable natural light across the room. The geometry also helps regulate heat transfer.

The concrete surrounding the opening acts as thermal mass, moderating the temperature of the incoming light and preventing excessive heat gain in a warm humid climate.

The skylight also supports natural ventilation indirectly. By lifting the ceiling plane and creating vertical height, warm air can rise into the volume and move toward adjacent openings. This enhances the passive ventilation features noted in the submission, such as cross flow ventilation achieved through louvres and openings on opposing walls.

From a sustainability perspective, the skylight is a long term feature with no operational cost. It has no mechanical parts to maintain and no energy demand. Its integration into the concrete roof means it adds durability and resilience rather than requiring frequent replacement. Over the life of the building, this contributes to a reduction in energy use and avoids the material consumption associated with ongoing lighting upgrades.

This detail shows how a single opening, shaped with care and placed with intention, can improve comfort, reduce energy demand and elevate the interior experience.

The circular skylight becomes a simple and enduring environmental asset.

Designer of this project: Clinton Cole

Longevity Through Carbon

A centuries old charring method becomes a modern climate resilient solution.

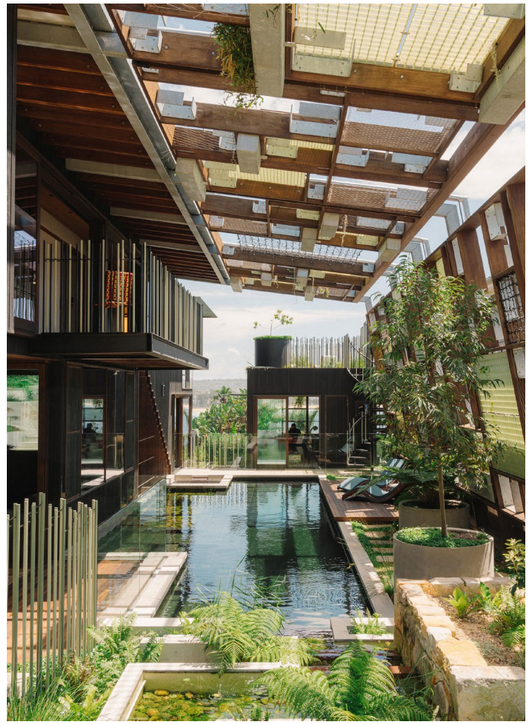
Among the many refined elements in Holocene House, the Shou Sugi Ban spotted gum cladding is one of the clearest examples of sustainable thinking at the scale of a single material choice. The submission describes this cladding as a low maintenance, durable and low impact external surface created through a traditional Japanese charring method (page 7). Its environmental value comes from both how it is made and how it behaves over its life span.

Shou Sugi Ban involves lightly burning the surface of the timber to create a protective carbon layer.

This eliminates the need for chemical primers, paints or film forming coatings. Over the life of the building, the absence of coating cycles prevents repeated use of petrochemical based finishes and avoids the resource cost of sanding and reapplication. In a warm temperate and coastal climate like Manly, exposure to salt and humidity quickly degrades conventional coatings, so choosing a finish that needs no renewal is a direct reduction in maintenance related emissions.

The timber itself is another part of the sustainability story. Spotted gum is a naturally durable hardwood, which means the charred surface reinforces an already robust material. This extends the lifespan of the cladding and reduces future replacement cycles. Longevity is one of the most important yet undervalued environmental strategies because every decade a material survives is a decade without new manufacturing, transport or waste.

A simple act of controlled burning turns local hardwood into a long life, low maintenance and low toxin building envelope that performs quietly year after year.



The charred surface also improves fire resilience. For a home that required compliance with a Bushfire Attack Level of 29, selecting a material that enhances ignition resistance through carbonisation adds both safety and environmental efficiency. Since the process relies on heat rather than chemical fire retardants, it avoids introducing toxins into the building envelope.

What elevates this detail is how it shapes indoor air quality. The project's interior material palette prioritises low toxin finishes, and the external cladding supports this by eliminating off gassing coatings that often migrate from outside to inside through windows, air movement or heat.

The Shou Sugi Ban timber skin is a compelling example of sustainability achieved through technique rather than technology.

Letting Materials Live On

A small band of reused masonry becomes the project’s quietest circular design move.

Designer of this project: Aaron Schumacher

Among the many considered choices in Dallimore House, one of the most meaningful is also one of the simplest. The selective use of recycled brickwork in feature areas stands out as a clear sustainability gesture that links material heritage with long term performance. This is noted directly in the materials section, where recycled bricks are listed as part of the low impact material palette.

Recycled brick offers two forms of sustainability. First, it carries almost no new embodied energy because the bricks already exist. They do not require new clay extraction, new firing, or long transport distances.

Each brick placed in the home represents material that has been kept out of landfill and reintroduced into a new architectural life.

Second, brick is a highly durable product. Its resistance to wear and weathering means these feature areas will outlast many surrounding materials without maintenance cycles or coatings. In a cool temperate climate like the Central West, longevity is an environmental asset because it reduces replacement, waste and future resource use.

The bricks also contribute a subtle thermal benefit. Their density allows them to act as a small pocket of thermal mass, absorbing warmth during the day and releasing it slowly as temperatures fall. Although the project includes larger passive strategies, the brickwork plays its own quiet role in smoothing temperature variation within adjacent spaces.

What elevates this detail is the way it connects the home to rural context. The colour, patina and texture of the recycled brickwork sit comfortably within the surrounding landscape. This ensures that the material will continue to feel appropriate as the home ages, further reducing the chance of future alterations or re cladding.

This is a reminder that sustainability is not always expressed at the scale of whole systems. Sometimes it is found in a single band of masonry that has lived a past life and is ready for another.

Recycled brickwork provides character, reduces impact and strengthens the project's long term environmental story.

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