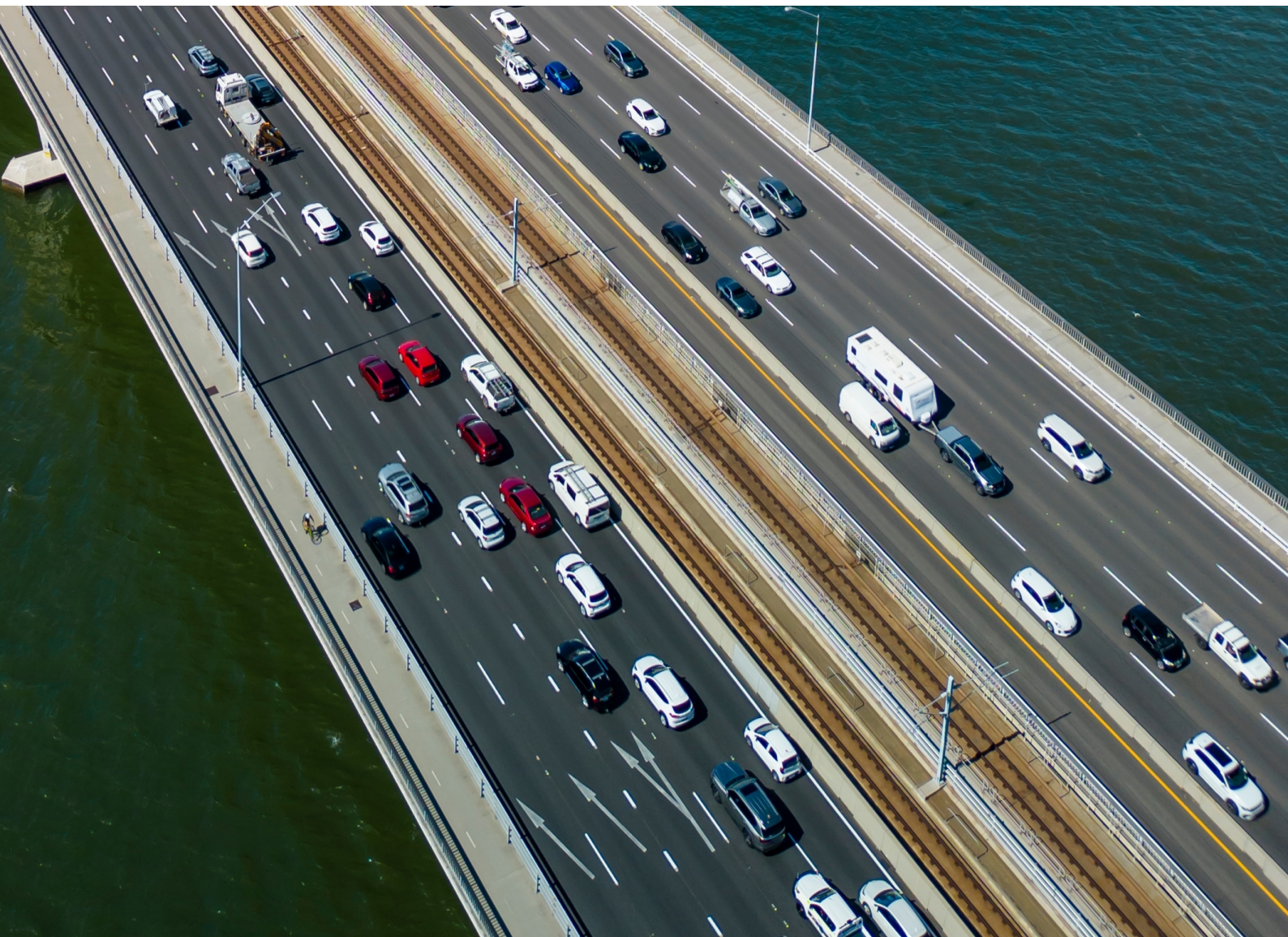


The Concrete House

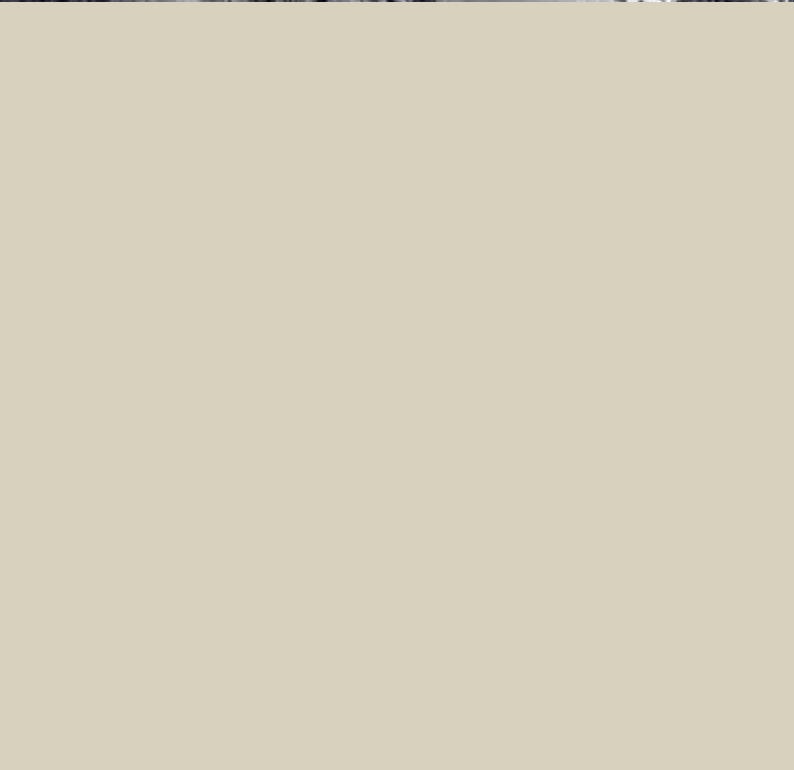
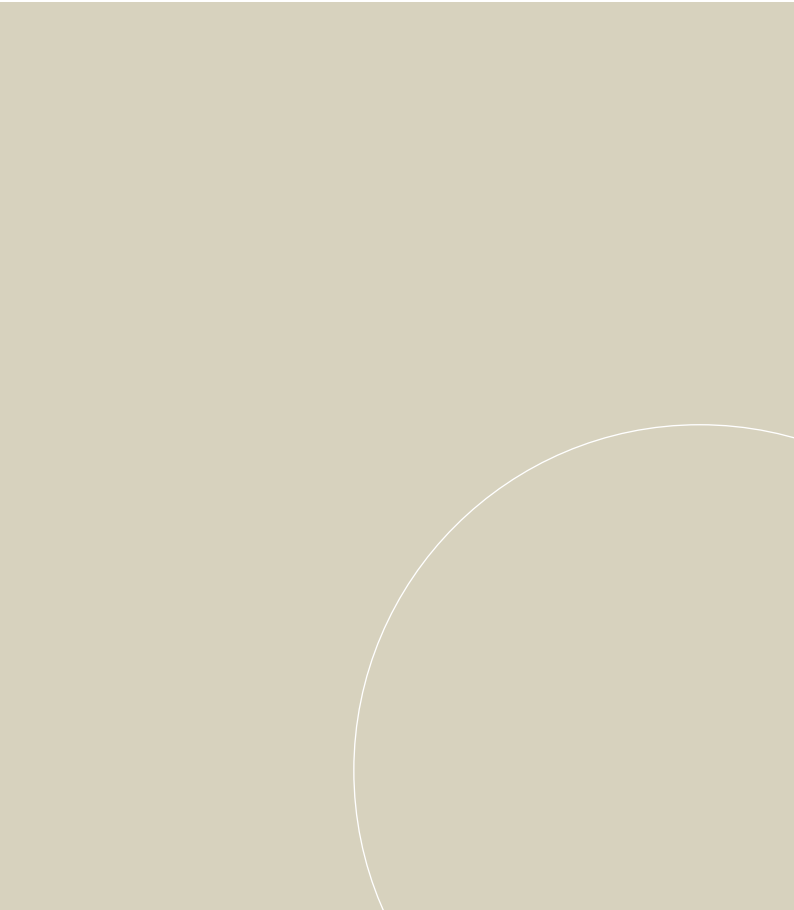


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the concrete house

the concrete house





Try to imagine a world without concrete?

It's almost impossible because concrete is everywhere – in our roads and bridges, our schools, hospitals, workplaces and homes.

In fact, next to water concrete is the most consumed material on the planet.

We love concrete because it's economical, adaptable and, in its own unique way, beautiful.

But it's also a responsible choice in terms of its environmental footprint.

Think about the advantages of building with concrete...



It's strong, long-lasting and low maintenance.

There's something comforting about a home made from concrete.

It's strong and solid. You feel safe and secure.

You also know it's going to be there for a long time, with little or no ongoing maintenance.



Energy efficiency...

The E House in the Canberra suburb of Watson was designed by Ric Butt of Strine Design to showcase energy efficiency and the contribution made by concrete.

Concrete walls and burnished concrete floors have been used to maximise the thermal mass internally. The burnished floors are integrally coloured using a pigment and have insulation installed around the perimeter.

Shallow pattern lines have been cut in the surface of the floor and external paving to provide scale to larger areas.

The external walls consist of concrete 'sandwich' panels (with a polystyrene core), while internal walls are 100-mm-thick solid concrete panels. Both the floor and off-form grey concrete walls are protected with a clear sealer.

Precast panels provide unbeatable thermal mass and insulation, each being an essential component of passive solar design.

In winter, the concrete slab and walls retain the heat absorbed through north facing windows, emitting it slowly overnight and thereby heating the house. In summer, when the sun travels overhead, the concrete keeps the internal spaces cool.



You can have a home that's as individual as you.

If you're designing and building your dream home, concrete can help you create something that is not only stunningly beautiful, but absolutely unique.

Concrete can be formed into a variety of shapes. Curved and free-flowing walls - both load-bearing and feature - and good-looking, practical polished floors are easily achievable and extremely cost effective.

Concrete can also be coloured or stained and 'seeded' with a wide range of natural stones (even coloured glass). It can be polished, sandblasted or hand trowelled to highlight these different additives and provide a truly bespoke finish.



Maintenance-free...

Designed by richard szklarz architects, the award winning Gibney Street residence at Cottesloe has been constructed with materials and finishes that will withstand the harsh marine environment.

Hence off-form concrete features prominently, chosen for its maintenance-free longevity and ability to mature elegantly within its harsh surroundings.

The home features a concrete roof slab, covered on top with white tiles to reflect the solar heat load and insulated below.

Exterior concrete surfaces are sealed with clear sealer to maintain the natural look.

An eastern concrete boundary wall encloses and connects the outdoor with the interior, while large glass doors further enhance and promote a blurring of the connection between inside, outside, house and pavilion.

Photos: David Morecombe



It's a good choice for a sustainable future.

The longer a product lasts and the less maintenance it requires, the more economical it is and the lower its impact on the environment. Concrete is such a product.

Concrete can make a significant contribution to dematerialisation in the home. Many architects and homeowners love the off-form, 'natural' grey finish of concrete in walling and polished flooring applications. It means you can do away with paint, carpets or floating timber floors.

And concrete is virtually 100 per cent recyclable. At the end of its useful life, a concrete structure can be broken up and reused – as the 'aggregate' for new concrete or in applications like roads.

It can help lower your energy bills.

From a home heating and cooling perspective, concrete is the ideal walling and flooring material when combined with other passive solar design principles.

That's because of its inherent mass. In summer, a concrete floor or wall helps stabilise the temperature inside your home. In winter, it stores heat captured from the sun and releases it slowly at night.

This means you can reduce your energy costs and contribute to lower CO² emissions.



It resists termite attack.

It's simple – termites don't eat concrete.

A home with significant concrete structural elements – like a slab floor, walls, outdoor patios and paths – helps protect your valuable asset from the ravages of termite attack. **It makes for a quieter home.**

Again, because of its mass concrete helps reduce the transmission of sound – be it from neighbours, traffic or nature.

Innovative composite systems, combining the performance of concrete with other materials, can be a very economical and effective noise dampening solution.



Concrete wall and floors are also particularly good at eliminating or significantly reducing vibration from outside sources.



Concrete and LCA

Life Cycle Assessment (LCA) is a way of measuring a product's environmental impact over its whole life, from 'cradle to grave'.

Some LCA tools only look at part of a product's life cycle – for example, from the acquisition of raw materials in the ground through to its manufacture.

But to be really useful, LCA analysis needs to include the operation, maintenance and final disposal of the product.

In the case of concrete, the 'environmental cost' of making the material is far outweighed by the long-term benefits it provides in typical building applications.

These include its durability, recyclability and low maintenance qualities, as well as its thermal mass qualities that can help drive down energy consumption (and CO₂ emissions) for heating and cooling.

It's well suited for building in areas prone to flooding, bushfire and cyclones.

When designed and built appropriately, concrete homes and buildings can easily meet the fire and bushfire resistance criteria in Australian building codes and standards.

In a bushfire, concrete both insulates and resists deformation – even at high temperatures. And unlike many building products, it does not emit toxic fumes when subject to extreme temperatures.

The strength and durability of concrete also makes it ideal for homes and buildings in areas subject to flooding and cyclones.

It doesn't release toxins in your home, and is good news for allergy sufferers.

We all worry about chemicals and toxins in the environment. Many everyday items in the home can release these nasties into the air without us even knowing.

Not concrete. It's inherently stable and void of any known carcinogens.

A polished concrete floor is also a safe and effective alternative to carpet and other flooring materials that can harbour dust, mites and allergen particles. (Combined with this, it's hard-wearing and quick and easy to clean.)



Concrete in the home

When it comes to building a home, most people only think about concrete for footings, floor slabs, paving, outdoor patios and the like.

There's a reason concrete is so popular for these applications. It's reliable, economical and fast to work with.

But more and more architects and homeowners are exploring ways of using concrete beyond these simple applications.

These days, you can build an all-concrete home – floor, walls, roof, or any combination – for much less than you'd think.

You can also add beautiful, bespoke features like polished concrete benchtops and floors.

Insitu, off-form walls

Insitu is a term used to describe concrete that is formed and poured on site (as opposed to precast, which is typically poured and cured in a factory as a prefabricated element).

'Off-form' describes the finish that is imparted by the timber formwork used to construct the insitu wall.

Insitu, off-form construction affords enormous design flexibility. You can use it to achieve curved or stepped walls – both external and internal – and walls with unique qualities such as cut-outs or cast-in forms.

Concrete walls can be clad with conventional products like plasterboard, or they can be left in their raw, natural state – or even stained or painted.



Less is best...

The Small House, in Sydney's Surry Hills, demonstrates that size isn't everything.

In this case, architect Domenic Alvaro of Woods Bagot Architects has designed a home with a remarkable sense of proportion and space on a six by seven metre inner city block.

His solution was to go up four storeys, and to do that he opted to build his home entirely from high-quality precast concrete wall and floor panels.

This form of construction was ideal for such a small and congested construction site, as the panels were prefabricated offsite and quickly erected over a four-day period, reducing the need for extended (and costly) road closures.

The entire structure was completed in three weeks, including footings, underpinning neighbouring properties, wall, floors, installation of windows and the roof.

Concrete has not only ensured good noise insulation in the inner city environment, but meets sustainability goals through the use of existing moulds and the incorporation of recycled materials into the mix.

On top of that, the large thermal mass of concrete also helps reduce ongoing operational energy costs to heat and cool the house over its lifetime.

Photos: Trevor Main



Precast concrete homes

The use of prefabricated concrete walling systems for single storey dwellings is becoming increasingly popular and widespread.

This form of construction is often called tilt-up. The concrete panels are typically poured and cured in a factory, delivered to site and 'tilted' into place using a crane. There is no excess building waste on site.

The big advantage of such systems is speed. A panelised concrete house can be finished to lock-up in a fraction of the time it takes to construct a timber-framed, brick veneer dwelling. It also provides straight, true surfaces for following trades.

Polished concrete floors

Many homes are built on concrete slabs.

But rather than covering the slab with carpet or timber, it can easily be adapted as an attractive, low maintenance and cost effective finished flooring solution.

There are a number of different methods and standards of finish. A highly polished finish is usually achieved by honing (machine grinding). Honing also exposes the aggregates (stones) in the concrete, creating a highly individualised finish. (No two polished concrete floors are the same).

Concrete floors and walls can also be coloured by adding pigment to the wet concrete mix, or by applying stains, dyes, paint and surface sealers.





Polished benchtops

More and more designer homes feature kitchen and bathroom benchtops of polished concrete.

These are usually constructed insitu and, like concrete floors, can be integrally coloured and/or finished to a range of different surface qualities.

Not only is a concrete benchtop extremely hard wearing, but it can be very cost effective when compared to natural or manufactured stone.





A polished performer...

Designed by Ric Butt, the Westgarth House in the Canberra suburb of O'Connor is an outstanding example of passive solar design harnessing the thermal efficiency of concrete.

The external walls are insulated concrete 'sandwich' panels (polystyrene sandwiched between two skins of concrete); the internal walls solid concrete panels.

The house has a beige-coloured burnished concrete floor throughout, achieved by hand-casting and trowelling a pigment into the surface.

Outside, the concrete paving features saw cuts to give the appearance of large format pavers, and has been coloured to match the internal floors. This provides a consistency of finish that extends the living space outdoors when the glass doors are rolled back and the area is opened up.

The Westgarth House provides five star energy benefits, high levels of insulation, outstanding acoustics and total fire proof protection.



Around the home

Concrete paving, patios and driveways aren't what they used to be.

The use of different colours in the concrete mix and/or applied finishes (such as stenciling and stamping) lets you achieve highly individualised finishes that blend with your home and environment.

One thing, of course, hasn't changed. Concrete is still one of the fastest and most economical ways to achieve hard wearing, large-area outdoor surfaces.





To find out more about the many ways you can use concrete in your home, talk to your builder or architect, or visit www.ccaa.com.au



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